U.S. Department
of Transportation

**United States
Coast Guard**

Major Systems Acquisition Manual

COMDTINST M4150.2F

U.S. Department of Transportation

United States Coast Guard

Commandant
United States Coast Guard

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COMDTINST M4150.2F

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COMMANDANT INSTRUCTION M4150.2F

Subj: MAJOR SYSTEMS ACQUISITION MANUAL

1. **PURPOSE.** To establish policy, prescribe procedures, and provide guidance for the administration of Coast Guard major systems acquisitions[1]. Procedures outlined in this Manual are intended for all personnel dealing with major systems acquisitions.

2. **ACTION.** Area and district commanders, commanders of maintenance and logistics commands, commanding officers of Headquarters units, assistant commandants for directorates, Chief Counsel, and special staff offices at Headquarters shall ensure compliance with the provisions of this Manual. Internet Release Authorized.

3. **DIRECTIVES AFFECTED.** Systems Acquisition Manual, COMDTINST M4150.2E dated 11 December 1997, is canceled.

4. **MAJOR CHANGES.** This is an update of the Systems Acquisition Manual (SAM). The name of the Manual has been changed to Major Systems Acquisition Manual (MSAM) to place emphasis on major systems and reflect the shift from Office of Management and Budget (OMB) Circular A-109 to OMB Circular A-11 and other federal acquisition policy changes. The basic acquisition management and oversight process embodied in previous editions of the SAM remains essentially the same. Changes have been made to reflect Headquarters streamlining and reorganization. Acquisition process improvements have also been incorporated. Changes in the MSAM include:

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[1] Major systems acquisitions generally exceed $50 million in acquisition costs, however $50 million is the starting point for identifying potential major systems acquisitions and **is not the sole factor** in determining project status. The Major System Acquisition Designation Criteria, in Table 3-1, must be considered when developing a recommendation for designating a project as a major systems acquisition. Contracting offices other than Commandant (G-ACS) may have large dollar procurement actions, but based on the criteria in the table, those actions would not qualify as major systems acquisitions. Major systems acquisitions are originated and executed solely from Headquarters.

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NON-STANDARD DISTRIBUTION:

a. Chapters 1 and 2 - These chapters contain major systems acquisition policy. Changes in these chapters are described below.

   (1) Chapter 1, Introduction: Requirements of the OMB Circular A-109 have been replaced by the OMB Circular A-11.

   (2) Chapter 2, Major Systems Acquisition Process: The major acquisition process has been aligned to implement A-11's useful segments, which included combining the former Concept Exploration and Demonstration & Validation Phases and adding discretionary key decision points. The Department of Defense acquisition phase naming conventions have been adopted for inter-service consistency.

b. Chapters 3 through 6 - These chapters contain procedures needed to manage major acquisitions. Changes in these chapters are described below.

   (1) Chapter 3, Requirements Management Process:

      (a) General - Aligned the Requirements Management Process to the Coast Guard Business Planning Process.

      (b) Streamlined Project Initiation - Combined the Requirements Definition and Project Initiation Phases, eliminated the requirement for Mission Analysis Reports, and updated the Mission Need Statement content requirement to reflect the "Three Pesky Questions" of A-11.

      (c) Operational Requirements – Changes to the Operational Requirements Document (ORD) include: adding Key Performance Parameters (KPPs), and requiring Chief Information Officer endorsement for all projects.

   (2) Chapter 4, Acquisition Management Processes:

      (a) General - Eliminated redundancies found across project planning document.

      (b) Project Management Planning – Added risk management planning to the Project Management Plan (PMP) and eliminated the Risk Management Plan (RMP).

      (c) Acquisition Strategy Planning – Replaced SAM Chapter 5, Contract Management Processes with an Acquisition Strategy Planning section, which eliminated redundancies with other acquisition and procurement policy documents. The Acquisition Strategy Proposal was added to replace the Phase One Proposal. The requirements for formal Acquisition Plans (APs) were retained.

(d) Test and Evaluation Planning – Increased the cost threshold for mandating Independent Operational Test and Evaluation (IOT&E) from $250M to $500M.

(e) Operational Logistic Support – Eliminated the requirement for a separate Operational Logistic Support Plan (OLSP). The Integrated Logistic Support Plan (ILSP) will be provided to the Sponsor during the transition from acquisition to operation support.

(f) Configuration Management (CM) Planning - Eliminated the requirement for a separate project Configuration Management Plan (CMP). Standard project CM direction is provided in Chapter 4; project unique CM requirements are addressed in the project Configuration Control Board (CCB) Charter.

(g) Concept Exploration Benchmarks (CEB) - Eliminated the requirement for the CEB.

(3) Chapter 5, Resource Management Processes: Replaced the former SAM Chapter 6 and revised the discussion of the resource management process to reflect the current Coast Guard Business Planning Process. Combined the Life Cycle Cost Estimate (LCCE) and Cost Benefit Analysis (CBA) into a single Cost Analysis document and delegated approval to G-A.

(4) Chapter 6, Administrative Processes: Replaced the former SAM Chapter 7. The review and clearance process for acquisition planning documents has been streamlined and electronic matrix level reviews are permitted.

c. Enclosures contain guidance; i.e., information that is helpful, but not mandatory, for managing major acquisitions. The Enclosures consist of:

(1) Enclosure (1), Project Management Tools, to which guidance on Human Systems Engineering and Risk Management Tools has been added, and

(2) Enclosure (2), List of Acronyms.

5. **DISCUSSION.** This Manual is a guide for major system acquisition projects. Descriptions are provided for the major systems acquisition process, project management organization and responsibilities, and the project management process. Policy, procedures, and guidance are provided for applying a uniform approach to acquisition planning from initial design through deployment, resource management, acquisition execution and contracting. Integral to the acquisition process is the human resources program, which: is essential to link hardware, software, and people; and includes human factors engineering, system and personnel safety, manpower, personnel, training, and other performance interventions. OMB Circular A-11, Part 3, Capital Programming is implemented.

6. **WAIVERS.** Requests for exceptions to this document shall be submitted through the CGARC Executive Secretary, Commandant (G-A-2), to the Acquisition Executive (AE) for a decision. Requests shall contain sufficient detail to clearly explain the basis of the request, procedures sought to be waived, and any recommended alternative action.

7. **REQUIREMENTS/CHANGES.** All current major system acquisition projects must conform to the contents of this document by the next Key Decision Point (KDP) or within six (6) months of promulgation of this Instruction (or whichever comes first). Recommended changes to this manual or requests for additional copies should be submitted to Commandant (G-A-2).

T. W. JOSIAH
CHIEF OF STAFF

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Chapter 1

INTRODUCTION

1. Purpose

The purpose of this Manual is to establish policy, prescribe procedures, provide project management guidance, and impose top management oversight for Coast Guard Major Systems Acquisitions. The Manual provides a disciplined process for acquiring capital assets that includes the key principles of: thorough planning, risk management, full funding, performance-based acquisition management, accountability for meeting goals, and cost effective life-cycle management.

2. Scope

The Manual applies to major systems acquisitions. Major systems acquisitions are a subset of capital assets and may include systems (including Information Technology (IT) Systems), subsystems, components, or enhancements to existing systems.

- Capital assets, as defined by Office of Management and Budget (OMB) Circular A-11, are land, structures, equipment, and intellectual property, including software, that are used by the Federal Government and have an estimated useful life of two years or more.
- Capital assets include not only the assets as initially acquired but also: additions, improvements, modifications, replacements, rearrangements, re-installations, and major repairs but not ordinary repairs and maintenance.
- Capital assets exclude items acquired for resale in the ordinary course of operations or held for the purpose of physical consumption such as operating materials and supplies.
- Construction or other improvements to real property are excluded from the Coast Guard Major Systems Acquisition process.
- The acquisition cost of a capital asset includes both its purchase price and all other costs incurred to bring it to a form and location suitable for its intended use. Capital assets may be acquired in different ways: through purchase, construction, or manufacture; through a lease-purchase or other capital lease; through an operating lease for an asset with an estimated useful life of two years or more; or through exchange.

3. Process Implementation

The Manual provides guidance for acquiring major systems, which meet cost, schedule, and performance requirements. Criteria for designating acquisitions as major or intermediate acquisitions are discussed in Chapter 2.

The Manual implements A-11 Part 3, *Planning, Budgeting, and Acquisition of Capital Assets*, and its supplement the *Capital Programming Guide*, with respect to major acquisitions. Guidance is provided for: applying a uniform, yet tailored, approach to acquisition planning from initial identification of need through deployment, resource management, acquisition execution and contracting, and meeting the reporting requirements of the Department of Transportation (DOT) and Congress.

The Manual applies to all Coast Guard elements involved in the planning, management, support or oversight of Coast Guard major acquisitions, including operating, facility, acquisition, and support program offices and field activities.

4. Acquisition Project Content and Tailoring

Each acquisition project is unique, and will have to be tailored based on the requirements and guidance provided in this Manual to best suit its particular needs, especially the acquisition strategy being employed or considered. Tailoring of procedures is not formally approved, but is tacitly approved when formal planning and decision documents are approved.

A primary goal in developing an acquisition strategy shall be to minimize cost, schedule and performance risks with common sense and sound business practice. Core activities must be accomplished for every acquisition project. The core activities are to:

- establish and document the operational requirements;
- develop the acquisition strategy and project baseline;
- determine life cycle cost;
- conduct cost-benefit analysis;
- determine affordability;
- conduct environmental impact analysis;
- determine operational effectiveness;
- determine production readiness and supportability; and
- complete developmental and operational testing.

The extent to which each core activity is required for a given major acquisition will be tailored to the circumstances of the individual project. There is no one best way to structure an acquisition. Decision-makers and project managers shall tailor acquisition strategies to fit the particular conditions of an individual program, consistent with common sense, sound business management practice, applicable laws and regulations, and the time-sensitive nature of the user's requirement. Tailoring shall be applied to various aspects of the acquisition system, including project documentation, acquisition phases, the timing and scope of decision reviews, and decision levels. Tailoring does not imply that the requirements set in this Manual will be eliminated.

5. Major Acquisition Process Overview

a. Acquisition Phases

Major acquisitions are treated in a systematic manner progressing from planning to execution. The major acquisition process phases are:

- Project Initiation Phase,
- Concept & Technology Development (CTD) Phase,
- System Development & Demonstration (SDD) Phase, and
- Production and Deployment (P&D) Phase.

Based on the nature of the project and the top management decisions needed, the acquisition phases may be divided into useful segments, which are discussed in Chapter 2.

b. Key Decision Points

The Coast Guard Acquisition Review Council (CGARC) reviews major acquisitions at several Key Decision Points (KDPs) throughout the process. KDPs are either required or discretionary. At each KDP review, the project must demonstrate progress, successful satisfaction of the established exit criteria and a readiness to move forward to the next acquisition activity.

- Required KDPs follow the specific phases of the acquisition process.
- Discretionary KDPs may be required at critical milestones within acquisition phases when top management decision-making is necessary.

6. Higher Level Documents

The Coast Guard major acquisition process and this Manual follow specific directives. These directives are summarized below.

a. Office of Management and Budget Circular A-11

Circular A-11, Preparing and Submitting Budget Estimates, is OMB's annually updated direction for preparing and submitting budget estimates for all Executive Branch agencies. Key features of the policies include:

- Part 1 provides instructions for developing the President's budget.
- Part 2 implements the Government Performance and Results Act (GPRA) and provides guidance on planning and performance reporting.
- Part 3 discusses the planning, budgeting and acquisition of capital assets; and implements GPRA, the Federal Acquisition Streamlining Act (FASA) and the Clinger-Cohen Act. OMB's supplement to Part 3, the Capital Programming Guide, establishes the basic project management requirements for major acquisitions.

b. Office of Management and Budget Circular A-130

Circular A-130, Management of Federal Information Resources, establishes policy for the management of Federal information resources. The Paperwork Reduction Act established a broad mandate for agencies to perform their information resources management activities in an efficient, effective, and economical manner. Key features of the policies include:

- Integrated approach to information resource management.
- Uniform and consistent information resource management policies.
- Information management principles, standards, guidelines and legal mandates.
- Information resource management practices evaluation to determine adequacy and efficiency.
- Compliance of practices with the policies, principles, standards, and guidance promulgated by the Director of OMB.

c. Federal Acquisition Regulation

The Federal Acquisition Regulation (FAR) provides uniform policies and procedures for procurement and contracting by Federal government agencies. Part 34 establishes policies and prescribes procedures for major acquisitions to ensure that Federal agencies promote innovative and full and open competition in the development of major systems by:

- Expressing agency needs, project goals and objectives in terms of the agency's mission and not in terms of specified hardware.
- Focusing agency resources and special management attention on activities conducted in the initial stages of major acquisition projects.
- Sustaining effective competition between alternative major acquisition concepts and sources, as long as it is economically beneficial and practicable to do so.

d. Clinger-Cohen Act Pubic Law 104-106

The Clinger-Cohen Act (CCA), formerly the Information Technology Management Reform Act of 1996, focuses on capital planning and performance-based measurement for IT assets. The CCA also establishes Defense Acquisition Workforce Improvement Act-type (DAWIA) provisions for non-DoD agencies. CCA, which requires agencies to integrate IT investment plans and performance measures into the budget process, is implemented by OMB Circular A-11.

The CCA requirements for an enterprise architecture for the Coast Guard are prescribed by Commandant (G-CIT) in the Coast Guard Enterprise IT Architecture Framework, which provides a set of principles, guidelines, and rules that guide the Coast Guard through acquiring, building, modifying, maintaining, and operating IT resources while meeting its governmental responsibilities and mandates. The purpose of the Enterprise IT Architecture is to ensure interoperability and information exchange in support of Coast Guard assets and missions.

e. Computer Security Act Public Law 100-235

The Computer Security Act declares that improving the security and privacy of sensitive information in Federal Computer systems is in the public interest, and must create a means for establishing minimum acceptable security practices for such systems, without limiting the scope of security measures already planned or in use. The primary purposes of the Act include:

- Developing standards and guidelines for Federal computer systems
- Assuring cost-effective security and privacy of sensitive information in Federal computer systems
- Establishing the requirement of security plans by all operators of Federal computer systems that contain sensitive information
- Requiring mandatory periodic training for all persons involved in management, use, or operation of Federal computer systems that contain sensitive information.

f. Transportation Acquisition Regulation

The purpose of the Transportation Acquisition Regulation (TAR) is to implement and supplement the FAR and to establish uniform regulatory acquisition policies and procedures within the Department of Transportation (DOT).

g. Transportation Acquisition Manual

The Transportation Acquisition Manual (TAM) is a non-regulatory document. It contains DOT internal policy, procedures, and instructional guidance to the DOT contracting officers, specialists, administrators, and other personnel who either have the authority to or are associated with soliciting, negotiating, awarding, administering, and closing out DOT contracts.

h. Coast Guard Acquisition Procedures

The purpose of the Coast Guard Acquisition Procedures (CGAP), COMDTINST M4200.19 (Series), is to implement and supplement the FAR, TAR, Transportation Acquisition Manual (TAM), and DOT Orders, and establish Coast Guard acquisition policy.

i. USCG C4I Objectives Architecture & Transition Plan

The USCG C4I Objectives Architecture & Transition Plan (OATP), COMDTINST M3090.7 (Series), is an organizational master plan aimed at achieving command and control (C2) needed capabilities from a cross-programmatic vision. The OATP provides C2 requirements guidance for decision-makers from operations and marine safety mission programs; human resources and systems support programs; and budgeting/acquisition planning offices. It provides the business case for a unifying conceptual and technological framework to better employ information technology toward future command, control, communications and computers.

j. USCG Common Operating Environment

The USCG Common Operating Environment (CG COE), COMDTINST 5230.59 (Series) is the catalog of mandatory common IT products for meeting all Coast Guard IT requirements. All Coast Guard IT solutions being acquired, developed, or implemented shall comply with all provisions defined in the USCG COE and related directives.

7. Manual Organization

This Manual consists of three distinct areas of emphasis: policy, procedures, and guidance. The first two chapters discuss the policies governing Coast Guard major acquisitions. Chapters 3 through 6 discuss the procedures to be followed to comply with current policy provided in Chapters 1 and 2. The enclosures contain guidance, which is useful in managing major acquisitions.

a. Policy

(1) Chapter 1, Introduction

Introductory information including scope and applicability of the Manual is provided. Discussion of higher-level documents governing major acquisitions is provided.

(2) Chapter 2, Major Acquisition Process

This chapter discusses the policy governing Coast Guard major acquisitions, as required by higher-level authority. It provides definitions of acquisition categories, acquisition phases, and key decision points. The roles and responsibilities of the CGARC, the major acquisition review and decision-making body, are discussed. The bulk of the chapter is devoted to the activities and documentation required for major acquisitions, broken down by acquisition phase.

b. Procedures

(1) Chapter 3, Requirements Management

This chapter emphasizes the activities that are conducted to identify the mission needs, primarily by the Sponsoring organization prior to the designation of a project as a major acquisition. It also addresses the requirements definition process conducted once a project has been designated a major acquisition. The processes discussed in this chapter are the responsibility of the project Sponsor and/or the Sponsor's Representative.

(2) Chapter 4, Acquisition Management

This chapter discusses the procedures that are conducted by the Project Manager to deliver a product that meets the Sponsor's mission needs while achieving cost, schedule, and performance goals. Areas discussed include: project management planning, acquisition strategy planning, test and evaluation planning, integrated logistics support planning, configuration management planning, system safety planning, environmental considerations, enterprise IT architecture, and project termination planning.

(3) Chapter 5, Resource Management

This chapter discusses the procedures used to identify and obtain resources, including funding and personnel, needed to conduct major acquisition projects; and procedures for coordinating resource management activities, and developing cost benefit analyses and life cycle cost estimates.

(4) Chapter 6, Administration

This chapter discusses various administrative activities commonly associated with major acquisitions. Included are instructions for preparing CGARC briefings, Semi-Annual Reviews, Contract Review Boards, and several mandated management reports. Information regarding DOT Inspector General (DOTIG) and General Accounting Office (GAO) audits is also provided.

c. Guidance

(1) Enclosure (1), Project Management Tools

Enclosure (1) provides useful, but not mandatory, information to assist the Project Manager in the following areas:

- Work Breakdown Structures (WBS),
- Schedules and Scheduling Techniques,
- Cost Estimating and Analysis Techniques,
- Systems Engineering Management Techniques,
- Human Systems Engineering/Human Systems Interface (HSE/HSI), and
- Risk Management Techniques.

(2) Enclosure (2), Acronyms

Enclosure (2) provides a listing of all acronyms used in this Manual.

8. Waivers

Requests for exceptions to this document shall be submitted through the CGARC Executive Secretary, Commandant (G-A-2), to the Acquisition Executive (AE) for a decision. Requests shall contain sufficient detail to clearly explain the basis of the request, procedures sought to be waived, and any recommended alternative action.

Chapter 2

MAJOR ACQUISITION PROCESS

1. Introduction

This chapter describes the Coast Guard's major systems acquisition process, which implements the capital asset acquisition policy embodied in Office of Management and Budget (OMB) Circular A-11.

The OMB Capital Programming Guide provides principles and techniques for planning, budgeting, procurement, and management of capital assets. As illustrated in Figure 2-1, the acquisition process overlays the elements of the capital programming process. Acquisition process activities are designed to fulfill the capital programming key principles of: thorough planning, risk management, full funding, performance-based acquisition management, accountability for meeting goals, and cost effective life cycle management.

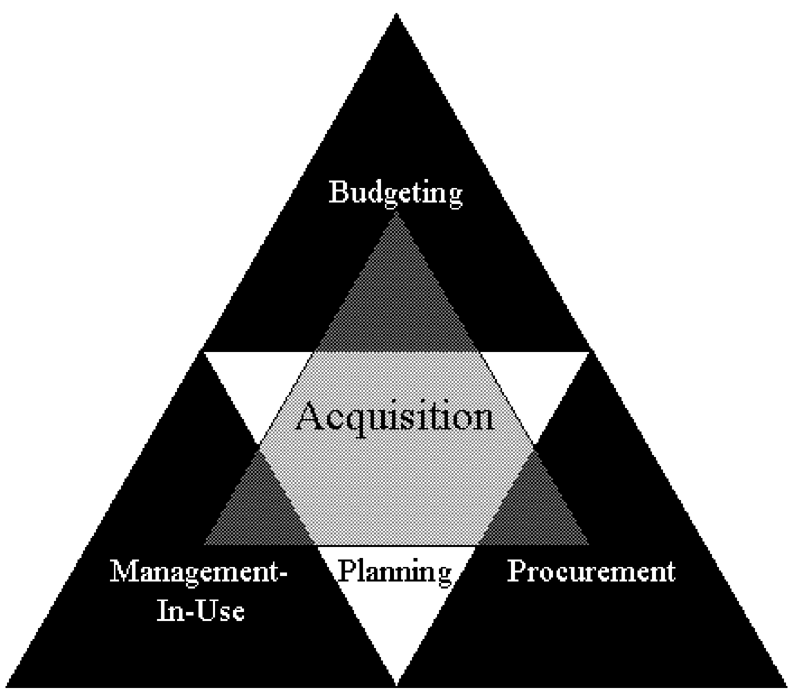

Figure 2-1, Acquisition in the Capital Programming Process

a. Major Systems Acquisitions

Major systems acquisitions include equipment and intellectual property (e.g., software) that is acquired by the Coast Guard through purchase, construction, manufacture, lease, or exchange and may also include improvements, replacements, or major repairs. Major systems acquisitions:

- Warrant special management attention and top management involvement, as shown in Table 2-1,
- **<u>Generally</u>** exceed $50 million[1] in acquisition costs,
- Are specifically designated by the Vice Commandant (G-CV),
- Are executed by the Assistant Commandant for Acquisition (G-A), and
- Are overseen by the Coast Guard Acquisition Review Council (CGARC).

Characteristics of Major Acquisitions
1. Importance to Coast Guard Missions
2. High Development, Operating, or Maintenance Costs
3. High Risk
4. High Return
5. Significance in Program, Finance, Property, or Resource Administration

Table 2-1, Characteristics of Major Systems Acquisitions

> *Major acquisitions may include projects below the $50M dollar acquisition cost level that warrant special management oversight and visibility due to project risk, cross-organizational issues or interest external to the Coast Guard.*
>
> *Procurements above the $50M dollar acquisition cost level with low risks that do not warrant the direct involvement of top management may be designated as non-major acquisitions.*

[1] $50 million is the starting point for identifying potential major systems acquisitions and **is not the sole factor** in determining project status. The Major Acquisition Designation Criteria, in Table 3-1, must be considered when developing a recommendation for designating a project as a major systems acquisition. Contracting offices other than Commandant (G-ACS) may have large dollar procurement actions, but based on the criteria in the table, those actions would not qualify as major systems acquisitions. Major systems acquisitions are originated and executed solely from Headquarters.

b. Major Systems Acquisition Process Structure

The acquisition process begins with a broad description of the mission need, at Project Initiation, and concludes with the delivery of a specifically defined product that meets operational requirements during Production and Deployment. Activities along the way include refining the operational requirements, reducing project risk and imposing affordability and schedule constraints.

(1) Acquisition Phases

Major systems acquisitions are treated in a systematic manner progressing from planning to execution, as shown in Figure 2-2. Before a major acquisition formally begins, the project must be initiated and the functional requirements defined.

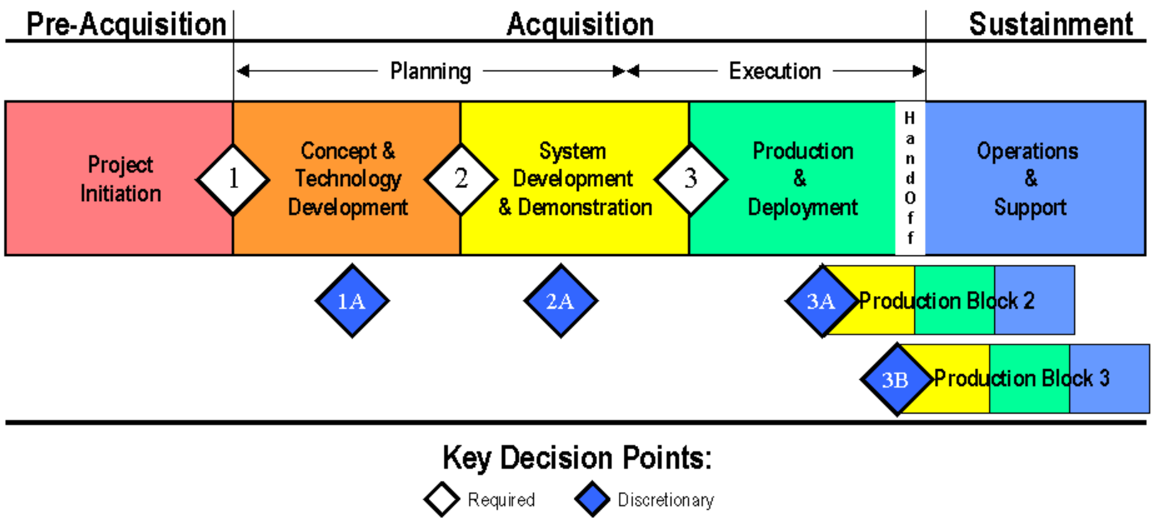

Figure 2-2, Major Acquisition Process

Once the Vice Commandant establishes a project, project activities are modularized into useful segments. Acquisition planning activities are segregated into planning segments. Acquisition execution activities are divided into segments, which produce useful assets. Useful assets must be economically and programmatically beneficial whole units such as production test items or production blocks of a specific quantity, regional deployment, or level of functional capability. The acquisition of useful assets must be fully funded.

- **Project Initiation Phase:** project definition activities culminate in the approval of the Mission Need Statement (MNS) and formal authorization to begin a major acquisition;
- **Concept & Technology Development (CTD) Phase:** is the acquisition planning phase;
- **System Development & Demonstration (SDD) Phase:** is a transitional phase between acquisition planning and execution; and
- **Production & Deployment (P&D) Phase:** is the acquisition execution phase.

To minimize acquisition cost and time, these phases may be tailored to each project's specific requirements and circumstances consistent with the mission need and the degree of risk inherent in developing the product.

Descriptions of the required acquisition phase activities are in later sections of this chapter.

(2) Key Decision Points

The CGARC reviews major acquisition projects at several Key Decision Points (KDPs). KDPs are either <u>required</u> or <u>discretionary</u>. At each KDP review, the project must demonstrate progress, successful satisfaction of the established exit criteria and a readiness to move forward to the next acquisition activity.

- **Required KDPs**, shown in Figure 2-3, come at the end of the specified phases of the acquisition process. The required KDPs (1, 2, and 3) mark the logical completion of the phase and the beginning of the next phase in the acquisition development cycle.

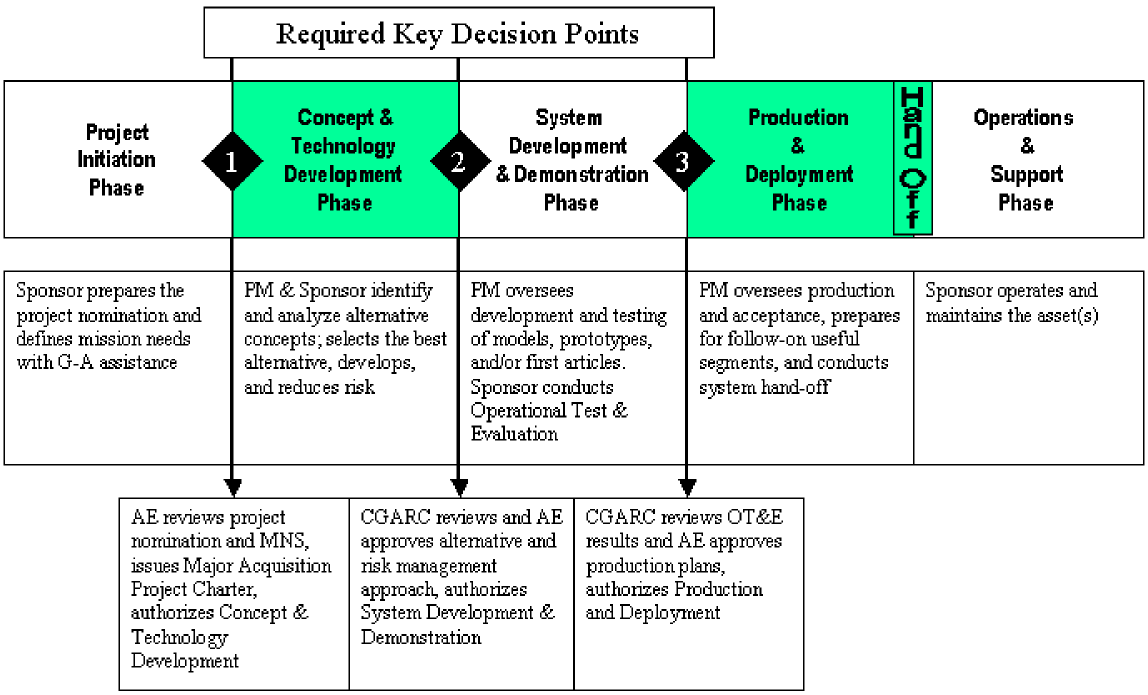

Figure 2-3, Required Major Acquisition Key Decision Points

- **Discretionary KDPs** may be required at critical milestones within the acquisition development process when, based on the nature of the project, top management decisions are needed. The discretionary KDPs are used to divide the acquisition phases and define phase segments. Each acquisition phase <u>**may have one or more**</u> discretionary KDP(s), which are labeled in an alphanumeric fashion, e.g., 1A, 2A, and/or 3A, 3B, 3C, etc. The discretionary KDPs are prescribed at the preceding KDP when exit criteria for the coming phase is established.

(3) Phase Segments

The major acquisition phases **may** be divided into phase segments to provide a modular approach to the acquisition development process. The modular approach is appropriate for projects that must examine a broad range of concepts or alternatives, involve extensive developmental work and/or testing, and/or produce assets in follow-on blocks or useful segments. **One or more** of the acquisition phases may be divided into phase segments depending on the nature of the project and its acquisition strategy. Discretionary KDPs are the transition points between the phase segments and permit top management the opportunity to review project progress and provide direction for future activities.

- Concept & Technology Development (CTD) Phase may be divided by KDP 1A into the Alternatives Analysis and Alternative Refinement phase segments. In Alternatives Analysis a broad range of concepts or alternatives are examined through market research and feasibility studies. At KDP 1A an alternative is selected for further development and risk reduction during Alternative Refinement as shown in Figure 2-4.

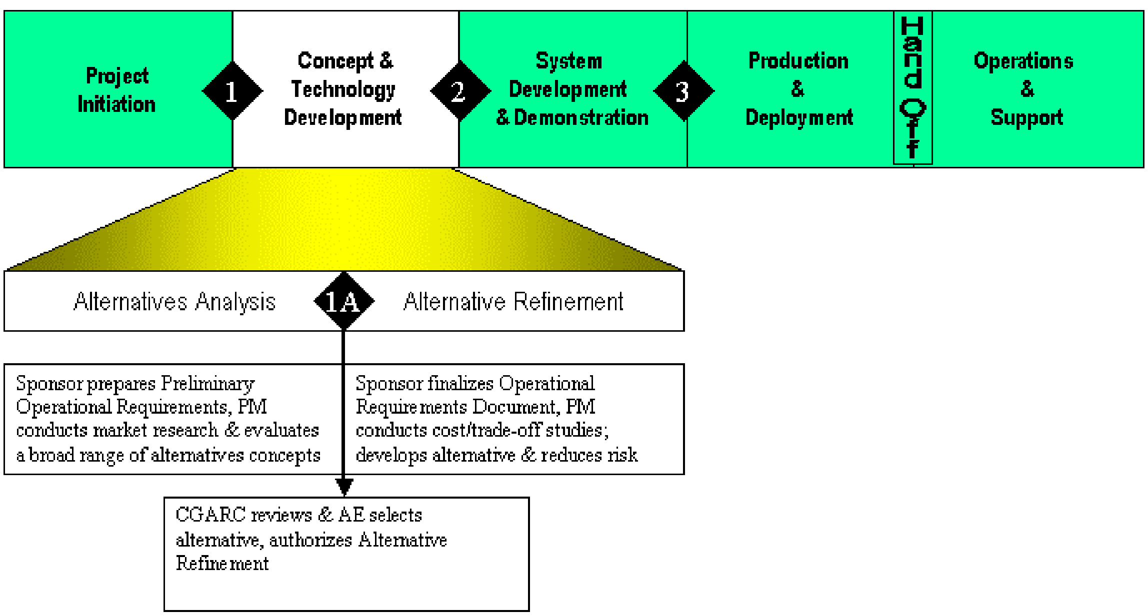

Figure 2-4, Discretionary Key Decision Point 1A and Concept & Technology Development Phase Segments

- The System Development & Demonstration (SDD) Phase may be divided by KDP 2A into the Development & Prototyping and Low Rate Initial Production segments. In Development & Prototyping models, mock-ups, prototypes and/or first articles are constructed for Developmental Test & Evaluation to demonstrate the technical feasibility of the alternative. KDP 2A is the Low Rate Initial Production (LRIP) decision point. During LRIP units required for Operational Test & Evaluation are produced and tested to demonstrate readiness for the Full Rate Production (FRP) decision at KDP 3 as shown in Figure 2-5.

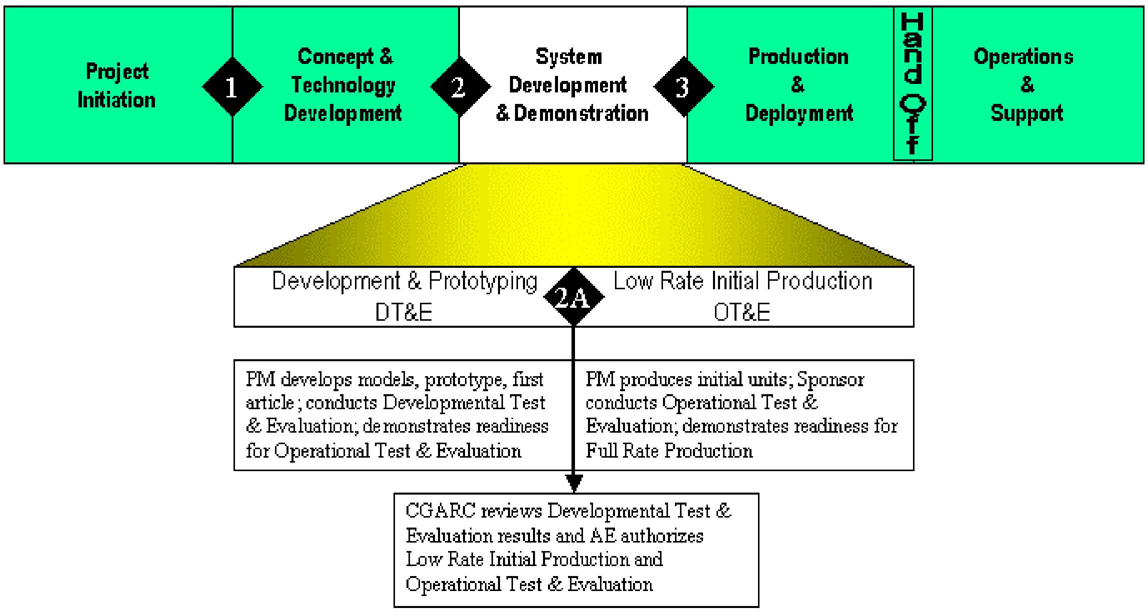

Figure 2-5, Discretionary Key Decision Point 2A and System Development & Demonstration Phase Segments

- The Production and Deployment (P&D) Phase may be divided into production blocks of useful assets by KDP 3A, 3B, etc. as required by the acquisition strategy of the project. At each discretionary KDP in the Production and Deployment Phase the Project Manager and the Sponsor must revalidate the mission need and affordability of the project prior to producing the next useful segment, as shown in Figure 2-6.

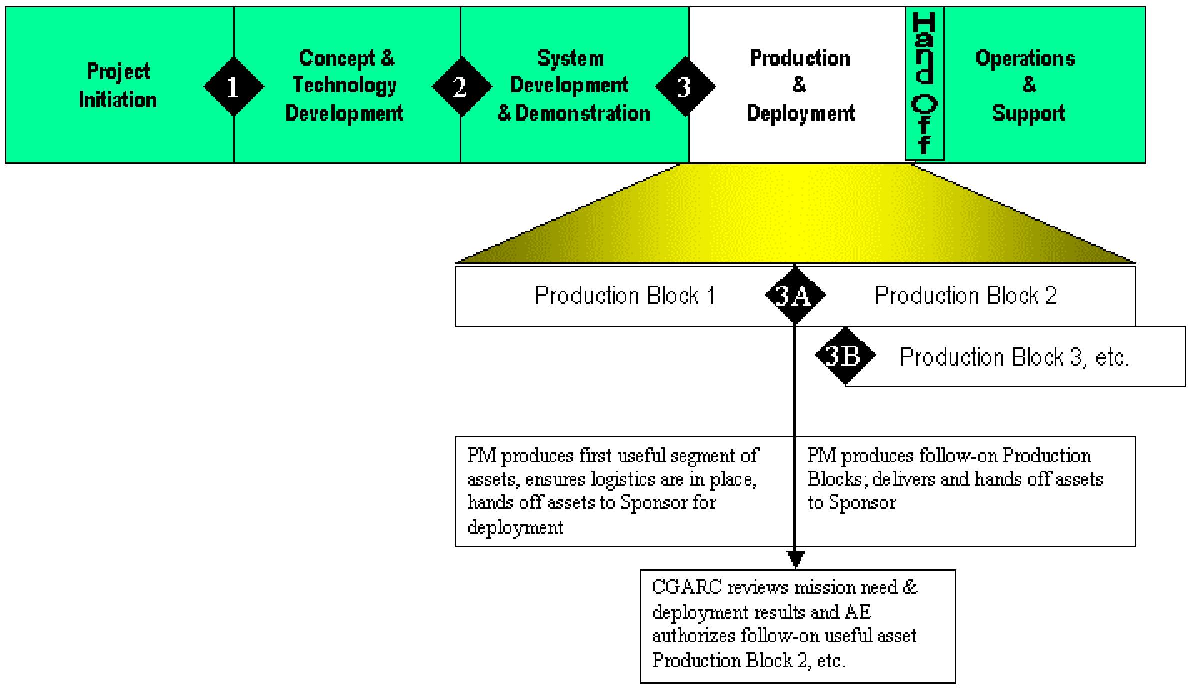

Figure 2-6, Discretionary Key Decision Point 3A and Production & Deployment Phase Segments

c. Acquisition Parameters

To categorize and manage acquisition activities the process can be segregated into three primary parameters: requirements management, acquisition management, and resource management. The acquisition process is designed to integrate and balance the parameters, as shown in Figure 2-7.

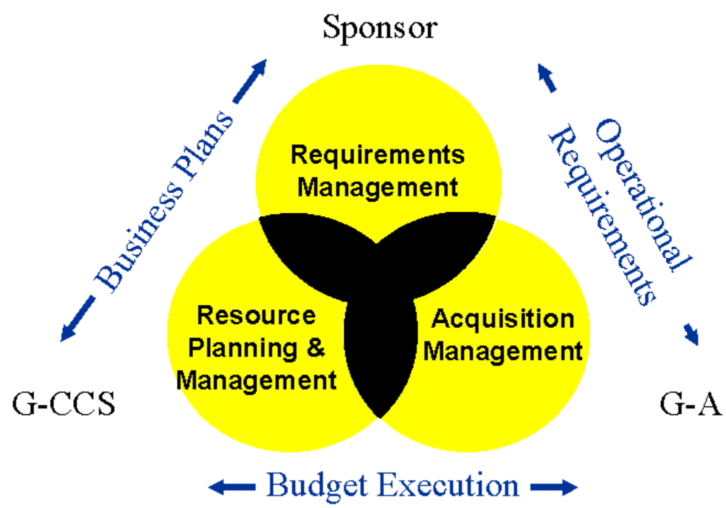

Figure 2-7, Acquisition Parameters

- Requirements Management – is the "Sponsor-owned" process of defining mission needs and translating them into user requirements, which culminates in the Operational Requirements Document (ORD). Chapter 3 describes the requirements management process.
- Acquisition Management – is the "Project Manager-owned" process of planning project activities including staffing and training, managing matrix member efforts, and controlling the project schedule. The acquisition management plans and activities are documented in the Project Management Plan (PMP) and are described in Chapter 4.
- Resource Planning and Management – is the planning, programming, and budget execution process owned by the Chief of Staff organization. Project resource planning and management is coordinated by the PM with involvement of the Sponsor and the Director of Resources, Commandant (G-CRC). Resource planning and management has two interdependent functions, providing project budget planning (for funding and personnel) and establishing affordability constraints. Resource planning and management activities are described in Chapter 6. Other Chief of Staff resource management and oversight functions included in this representation are the responsibilities of the Chief Financial Officer, Commandant (G-CFP), and the Chief Information Officer, Commandant (G-CIT).

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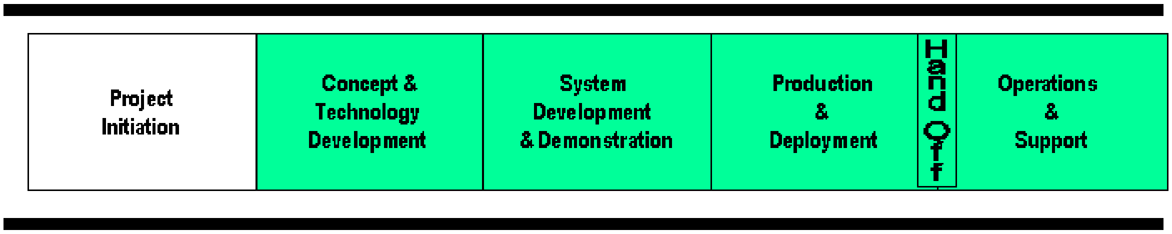
2. Major Acquisition Process Requirements

This section describes major acquisition procedures and summarizes the objectives, activities, documentation, reviews, and approvals for each of the acquisition phases.



a. Project Initiation Phase

During project initiation, project requirements are defined to set the bounds of the acquisition. Project initiation culminates in the Acquisition Executive's (AE) approval of the project's Mission Need Statement at KDP 1 and the issuance of a Major Acquisition Project Charter (MAPC).

Project initiation represents the convergence of requirements, resource, and acquisition management. Starting with the need for a potential major acquisition, the Sponsor, with assistance of the Acquisition Technical Support Staff (Commandant (G-A-2)), prepares a Project Nomination Proposal (PNP). Concurrently with the development of the PNP, the Sponsor will prepare a Resource Proposal (RP) for the initial project funding and staffing.

Project nomination procedures are described in Chapter 3.

(1) Phase Objectives

The objective of the Project Initiation Phase is to obtain Acquisition Executive AE, Commandant (G-CV), authorization to start a major acquisition project.

(2) Phase Activities

- Conduct business planning and identify a deficiency in mission execution capability.
- Consider supportability, data sharing and interoperability needs in the operational environment.
- Ensure the project is included in the Five Year Capital Investment Plan and Long Range Plan sections of the Agency Capital Plan (ACP).
- Develop a formal Mission Need Statement (MNS).
- Prepare a PNP.

- Prepare a RP for the initial project funding and staffing.
- For Information Technology (IT) projects, develop the application system perspective High Level Functional Concept Diagram as described in the Enterprise IT Architecture section of Chapter 4. For systems with Department of Defense (DoD) interoperability requirements or other DoD mandates, the DoD Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) architectural view OV-1, Operational Concept Graphic may be substituted.

(3) Phase Documentation

Documentation required for KDP 1 is shown in Table 2-2.

Key Decision Point 1 Documentation			
Document	**Preparation**	**Review**	**Approval**
• Mission Need Statement	Sponsor	CGARC	G-CV
• Project Nomination Proposal	Sponsor	Ex. Sec & G-CCS	G-CV

Table 2-2, Key Decision Point 1 Documentation

(4) Phase Review

The following review is conducted:

- CGARC KDP 1.

(5) Phase Approvals

The AE will:

- Approve KDP 1 and authorizes entry into the Concept & Technology Development Phase.
- Approve the MNS.
- Issue the MAPC, which:
    - ♦ Establishes the project as a Coast Guard major acquisition and authorizes project start.
    - ♦ Designates the Sponsor; defines the Sponsor role and responsibilities.
    - ♦ Designates the Sponsor's Representative.

- Directs the Acquisition Directorate to select a Project Manager and establish a Project Office.
- Defines the minimum set of alternatives to be explored.
- Establishes the Acquisition Strategy Proposal (ASP) submission date.
- Establishes the Concept & Technology Development Phase exit criteria submission date.
- Establishes the initial PMP submission date.

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Project Initiation	Concept & Technology Development	System Development & Demonstration	Production & Deployment	Hand Off	Operations & Support

b. Concept & Technology Development Phase

The Concept & Technology Development (CTD) Phase is the initial planning phase of the project. The CTD phase activities focus on setting operational requirements and exploring alternative solutions for meeting the needs described in the MNS. Typically, competitive, parallel short-term concept studies by the Government and/or industry will be conducted during this phase. The objective of CTD is to define and evaluate the feasibility of alternatives and to provide a basis for assessing the relative merits (e.g., advantages and disadvantages, degree of risk, life cycle cost, cost-benefit, etc.) of the alternatives. Alternative solutions are solicited from across industry to achieve the optimal solution, with emphasis placed on innovation and competition. Promising alternative solutions are defined in terms of cost, schedule, and performance objectives; identification of interoperability, supportability, and infrastructure requirements; opportunities for tradeoffs; an overall acquisition strategy; and a test and evaluation strategy (including Development Test and Evaluation (DT&E), and Operational Test and Evaluation (OT&E)). The results of the CTD phase provide the basis for selecting the optimal alternative at KDP 2.

(1) Phase Objectives

- Charter the Project Manager and establish or assign a project office and project matrix organization.
- Develop and evaluate a suitable, feasible, acceptable and affordable set of alternatives, which will best satisfy the mission requirements at an affordable cost with minimum acceptable technical risk.
- Explore the alternatives and select one alternative to be carried forward into the acquisition process.
- Identify the potential risk areas for each of the alternatives.
- Determine that critical product technologies are mature enough to enter System Development Demonstration (SDD) Phase and Low Rate Initial Production (LRIP), if required.
- Reduce risk and mature the product design in preparation for the SDD Phase.

(2) Phase Activities

- Initiate Project Management Planning:
  - ♦ Establish a project matrix team, consisting of the project staff, the Sponsor's Representative and support program members.
  - ♦ Prepare the PMP.
- Initiate Acquisition Planning:
  - ♦ Develop (Concept & Technology Development Phase) Acquisition Strategy Proposal (ASP).
  - ♦ Develop Concept & Technology Development Phase Exit Criteria.
  - ♦ Develop Acquisition Plan (AP).
- Develop Operational Requirements and prepare the Preliminary Operational Requirements Document (PORD). ***Finalizing operational requirements and preparing the Operational Requirements Document (ORD) by the end of the Concept & Technology Development Phase is required.***
- Explore alternatives and assess the major strengths and weaknesses of each.
- Conduct feasibility studies and/or cost and performance trade-off studies.
- Identify major trade-off opportunities for cost, schedule and performance.
- Evaluate the applicability of Commercial and Non-Developmental Items (CANDI) as a viable technology for incorporation in the alternative design and/or acquisition strategy.
- Complete system preliminary designs.
- Conduct Cost Analysis:
  - ♦ Develop Life Cycle Cost Estimates (LCCE).
  - ♦ Conduct Cost Benefit Analysis (CBA).
- Conduct Environmental Impact Analysis (EIA) to analyze and compare environmental effects of reasonable alternatives and define likely environmental costs and benefits throughout the acquisition process.
- Initiate Logistics Support Planning, organize the Integrated Logistics Support Management Team (ILSMT), prepare the Integrated Logistics Support Plan (ILSP), and implement initial support plans.
- Initiate Configuration Management (CM) Planning, organize the Configuration Control Board (CCB), prepare the Configuration Control Board Charter.

- Initiate Test and Evaluation Planning, establish the Test Management Oversight Team (TMOT), and prepare the Test and Evaluation Master Plan (TEMP).
    - Recommend, in the ASP, whether Independent Operational Test and Evaluation (IOT&E) should be conducted.
    - Initiate Developmental Testing (DT), Operational Assessment (OA) [optional], Operational Test (OT) planning and Independent Operational Assessment (IOA), if KDP 1A is required.
    - Perform tests to identify technologies or integration requirements, which impose risks, if KDP 1A is required.
- For IT projects, develop the application system perspectives (described in the Enterprise IT Architecture section of Chapter 4):
    - Functional Node Connectivity Description
    - Functional Information Exchange Matrix
    - System Interface Description
    - System Evolution Description
    - Technical Architecture Profile

  For systems with DoD interoperability requirements or other DoD mandates, the DoD architectural views OV-2, Operational Node Connectivity Description; OV-3, Operational Information Exchange Matrix; SV-1, System Interface Description; SV-8, System Evolution Description; and TV-1, Technical Architecture Profile may be substituted.

- For IT projects, conduct Technology Readiness Assessments (described in the Enterprise IT Architecture section of Chapter 4).
- Develop Acquisition Project Baseline (APB).
- Prepare Technical Data Package.
- Summarize the accomplishments and activities of the CTD phase and prepare an Acquisition Phase Summary (APS).
- Develop Exit Criteria for the next phase.

(3) Required Accomplishments

Listed below are the minimum required accomplishments for the Concept & Technology Development Phase.

- Charter the Project Manager.
- Obtain (CTD Phase) ASP approval (within six months of KDP 1).
- Obtain CTD Phase Exit Criteria (within six months of KDP 1).
- Obtain PMP approval (within six months of KDP 1).
- Establish operational requirements and complete the ORD.
- Charter the CCB.
- Document the major strengths and weaknesses of each alternative.
- Document results of feasibility and trade-off studies and analyses.
- Document results of cost analyses.
- Document major trade-off opportunities.
- Document test results and risk assessments, if KDP 1A is required.
- IT projects, document results of the Technology Readiness Assessment.
- Document the applicability of CANDI.
- Document results of EIA in accordance with COMDTINST 16475.1 (Series).
- Revalidate the MNS and Resource Impact Assessment (RIA).
- Recommend alternative to be carried forward.

(4) Phase Documentation

The documentation requirements for the Concept & Technology Development Phase are prescribed in the following series of tables. Table 2-3 shows the documentation required at KDP 2. When a discretionary KDP is required, Table 2-4 shows the documentation required at KDP 1A and Table 2-5 shows the follow-on documentation required at KDP 2.

Key Decision Point 2 Documentation

Document		Preparation	Approval
• Mission Need Statement (MNS)	R	SR	G-CV
• Acquisition Plan (AP)	X	PM	G-CV
• Project Management Plan (PMP)	U	PM	G-CCS
• Operational Requirements Document (ORD)	X	SR	G-CCS
• Acquisition Project Baseline (APB)	X	PM	G-CV
• Integrated Logistics Support Plan (ILSP)	X	PM	G-CCS
• Configuration Control Board (CCB) Charter	X	PM	G-CCS
• Cost Analysis (LCCE/CBA)	X	PM	G-CCS
• Test & Evaluation Master Plan (TEMP)	X	PM	G-CCS/ G-CV
• Independent Operational Assessment (IOA) Report, if required	X	IOTEA	N/A
• Operational Assessment (OA) Report, if required	X	SR	N/A
• Exit Criteria	X	PM	G-CV
• Acquisition Phase Summary (APS)	X	PM	N/A

Key

X	Prepare	PM	Project Manager
U	Update	SR	Sponsor's Representative
R	Revalidate	IOTEA	Independent Operational Test & Evaluation Advisor

Table 2-3, Key Decision Point 2 Documentation

Key Decision Point 1A Documentation			
Document		**Preparation**	**Approval**
• Mission Need Statement (MNS)	R	SR	G-CV
• Acquisition Plan (AP)	X	PM	G-CV
• Project Management Plan (PMP)	X	PM	G-CCS
• Preliminary Operational Requirements Document (PORD)	X	SR	Sponsor/ G-A
• Acquisition Project Baseline (APB)	X	PM	G-CV
• Integrated Logistics Support Plan (ILSP)	X	PM	G-CCS
• Configuration Control Board (CCB) Charter	X	PM	G-CCS
• Cost Analysis (LCCE/CBA)	X	PM	G-CCS
• Test & Evaluation Master Plan (TEMP)	X	PM	G-CCS/ G-CV
• Exit Criteria	X	PM	G-CV
• Acquisition Phase Summary (APS)	X	PM	N/A

Key			
X	Prepare	PM	Project Manager
U	Update	SR	Sponsor's Representative
R	Revalidate	IOTEA	Independent Operational Test & Evaluation Advisor

Table 2-4, Key Decision Point 1A Documentation

Key Decision Point 2 Documentation (Following KDP 1A)			
Document		**Preparation**	**Approval**
• Mission Need Statement (MNS)	R	SR	G-CV
• Acquisition Plan (AP)	U	PM	G-CV
• Project Management Plan (PMP)	U	PM	G-CCS
• Operational Requirements Document (ORD)	X	SR	G-CCS
• Acquisition Project Baseline (APB)	R	PM	G-CV
• Integrated Logistics Support Plan (ILSP)	U	PM	G-CCS
• Configuration Control Board (CCB) Charter, if necessary	U	PM	G-CCS
• Cost Analysis (LCCE/CBA)	U	PM	G-CCS
• Test & Evaluation Master Plan (TEMP)	U	PM	G-CCS/ G-CV
• Independent Operational Assessment (IOA) Report, if required	X	IOTEA	N/A
• Operational Assessment (OA) Report, if required	X	SR	N/A
• Exit Criteria	X	PM	G-CV
• Acquisition Phase Summary (APS)	X	PM	N/A

Key			
X	Prepare	PM	Project Manager
U	Update	SR	Sponsor's Representative
R	Revalidate	IOTEA	Independent Operational Test & Evaluation Advisor

Table 2-5, Key Decision Point 2 Documentation (Following KDP 1A)

(5) Phase Reviews

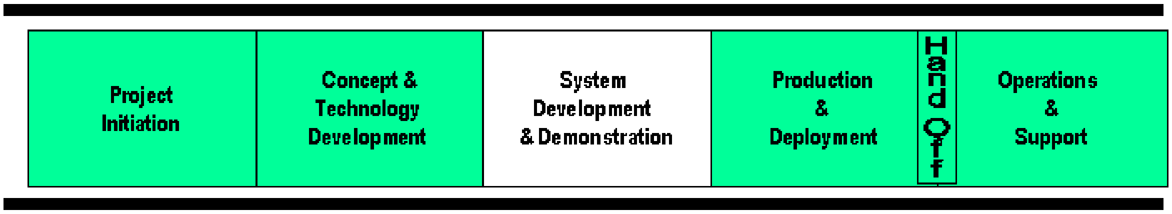
The following review will be conducted:

- CGARC - KDP 2.

(6) Phase Approvals

The AE will:

- Approve KDP 2 and authorize entry into the System Development and Demonstration (SDD) Phase.
- Approve the AP.
- Approve the APB.
- Approve the recommendation on IOT&E.
- Approve the alternative to be carried forward.
- Specify LRIP quantities (as necessary).
- Establish Exit Criteria for the next phase.



c. System Development & Demonstration Phase

The System Development & Demonstration (SDD) Phase is the transitional phase between acquisition planning and project execution. SDD phase activities include developing the first article for the completion of Developmental Test & Evaluation (DT&E). Operational Test & Evaluation (OT&E) is conducted on production representative units to confirm that the item meets the need described in the MNS and the ORD. Any LRIP units required for OT&E are fabricated during this phase.

(1) Phase Objectives

- Translate the most promising design approach developed in the Concept & Technology Development (CTD) Phase into a stable, producible, and cost effective product design.
- Demonstrate the manufacturing or production process.
- Demonstrate that the system capabilities meet contract specifications and minimum acceptable operational performance requirements and satisfy the mission need.
- Determine whether the product design is mature enough to commit to full production and deployment.

(2) Phase Activities

- Complete Production Design Specifications.
- Acquire/construct engineering development model(s), prototype, first article and/or LRIP units.
- Update logistics support requirements and continue ILSP implementation.
- Implement product configuration management program.
- Update Cost Analysis to reflect details of the production design and support requirements and to account for any changes in system performance and its associated benefits.
- Establish contract administration procedures/organization.

- Complete DT Report and confirm readiness for LRIP and Operational Test and Evaluation (OT&E).
- Conduct OT&E.
- Conduct Independent Oversight of OT&E (IOT&E), if required.
- For IT projects, update the application system perspectives (described in the Enterprise IT Architecture section of Chapter 4):
  - High Level Functional Concept Diagram
  - Functional Node Connectivity Description
  - Functional Information Exchange Matrix
  - System Interface Description
  - System Evolution Description
  - Technical Architecture Profile

  For systems with DoD interoperability requirements or other DoD mandates, the DoD architectural views OV-2, Operational Node Connectivity Description; OV-3, Operational Information Exchange Matrix; SV-1, System Interface Description; SV-8, System Evolution Description; and TV-1, Technical Architecture Profile may be substituted.
- For IT projects, conduct Technology Readiness Assessments.
- Coordinate with the Sponsor to initiate deployment planning and prepare the Deployment Plan (DP).
- Prepare the Resource Proposal and the necessary budget documentation to support the project as a line item in the Coast Guard budget request.
- Revalidate the MNS, APB, and RIA to ensure the mission need remains, project performance measures are being met, and that the Production phase structure of useful segments remains affordable within the Coast Guard capital asset portfolio.
- Summarize the accomplishments and activities of the SDD phase and prepare an Acquisition Phase Summary (APS).
- Develop Exit Criteria for the useful segment.

(3) Required Accomplishments

Listed below are the minimum required accomplishments for the System Development & Demonstration Phase.

- Achieve LRIP success, if applicable.
- Verify the adequacy of the manufacturing or production process.
- Confirm the stability and producibility of the product.
- Update cost analyses; provide a realistic estimate of production costs.
- Successfully complete OT&E.
- Provide OT&E results to the Independent Operational Test and Evaluation Advisor (IOTEA), if required.
- Receive acceptable OT&E and IOT&E Reports, if required.
- IT projects, document results of the Technology Readiness Assessment.
- Establish required production quantity.
- Structure the project in fully funded useful segments.
- Revalidate EIA and update documentation as necessary.
- Revalidate the MNS, APB, and RIA.

(4) Phase Documentation

The documentation requirements for the System Development & Demonstration Phase are prescribed in the following series of tables. Table 2-6 shows the documentation required at KDP 3. When a discretionary KDP is required, Table 2-7 shows the documentation required at KDP 2A and Table 2-8 shows the follow-on documentation required at KDP 3.

Key Decision Point 3 Documentation			
Document		**Preparation**	**Approval**
• Mission Need Statement (MNS)	R	SR	G-CV
• Acquisition Plan (AP)	U	PM	G-CV
• Project Management Plan (PMP)	U	PM	G-CCS
• Operational Requirements Document (ORD)	R	SR	G-CCS
• Acquisition Project Baseline (APB)	R	PM	G-CV
• Integrated Logistics Support Plan (ILSP)	U	PM	G-CCS
• Configuration Control Board (CCB) Charter, if required	U	PM	G-CCS
• Cost Analysis (LCCE/CBA)	U	PM	G-CCS
• Test & Evaluation Master Plan (TEMP)	U	PM	G-CCS/ G-CV
• Developmental Test (DT) Report	X	PM	N/A
• Operational Test (OT) Report	X	SR/S	N/A
• Independent Operational Test & Evaluation (IOT&E) Report, if required	X	IOTEA	N/A
• Deployment Plan (DP)	X	SR	S
• Project Termination Plan (PTP), within 12-18 months of last production unit	X	PM	G-A
• Exit Criteria, if follow-on Production Blocks are required	X	PM	G-CV
• Acquisition Phase Summary (APS)	X	PM	N/A

Key			
X	Prepare	PM	Project Manager
U	Update	SR	Sponsor's Representative
R	Revalidate	IOTEA	Independent Operational Test & Evaluation Advisor

Table 2-6, Key Decision Point 3 Documentation

Key Decision Point 2A Documentation			
Document		**Preparation**	**Approval**
• Mission Need Statement (MNS)	R	SR	G-CV
• Acquisition Plan (AP)	U	PM	G-CV
• Project Management Plan (PMP)	U	PM	G-CCS
• Operational Requirements Document (ORD)	R	SR	G-CCS
• Acquisition Project Baseline (APB)	R	PM	G-CV
• Integrated Logistics Support Plan (ILSP)	U	PM	G-CCS
• Configuration Control Board (CCB) Charter, if required	U	PM	G-CCS
• Cost Analysis (LCCE/CBA)	U	PM	G-CCS
• Test & Evaluation Master Plan (TEMP)	U	PM	G-CCS/ G-CV
• Independent Operational Test (IOA) Report, if required	X	IOTEA	N/A
• Operational Test (OA) Report, if required	X	SR	N/A
• Developmental Test (DT) Report	X	PM	N/A
• Exit Criteria	X	PM	G-CV
• Acquisition Phase Summary (APS)	X	PM	N/A

Key			
X	Prepare	PM	Project Manager
U	Update	SR	Sponsor's Representative
R	Revalidate	IOTEA	Independent Operational Test & Evaluation Advisor

Table 2-7, Key Decision Point 2A Documentation

Key Decision Point 3 Documentation (Following KDP 2A)			
Document		**Preparation**	**Approval**
• Mission Need Statement (MNS)	R	SR	G-CV
• Acquisition Plan (AP)	U	PM	G-CV
• Project Management Plan (PMP)	U	PM	G-CCS
• Operational Requirements Document (ORD)	R	SR	G-CCS
• Acquisition Project Baseline (APB)	R	PM	G-CV
• Integrated Logistics Support Plan (ILSP)	U	PM	G-CCS
• Configuration Control Board (CCB) Charter, if required	U	PM	G-CCS
• Cost Analysis (LCCE/CBA)	U	PM	G-CCS
• Test & Evaluation Master Plan (TEMP)	U	PM	G-CCS/ G-CV
• Developmental Test (DT) Report	X	PM	N/A
• Operational Test (OT) Report	X	SR/S	N/A
• Independent Operational Test & Evaluation (IOT&E) Report, if required	X	IOTEA	N/A
• Deployment Plan (DP)	X	SR	S
• Project Termination Plan (PTP), within 12-18 months of last production unit	X	PM	G-A
• Exit Criteria, if follow-on Production Blocks are required	X	PM	G-CV
• Acquisition Phase Summary (APS)	X	PM	N/A

Key			
X	Prepare	PM	Project Manager
U	Update	SR	Sponsor's Representative
R	Revalidate	IOTEA	Independent Test & Evaluation Advisor

Table 2-8, Key Decision Point 3 Documentation (Following KDP 2A)

(5) Phase Reviews

The following reviews will be conducted:

- CGARC - KDP 3.

(6) Phase Approvals

The AE will:

- Approve KDP 3 and authorize entry into the Production and Deployment Phase.
- Approve the updated AP.
- Specify the requirements for future key decision reviews, exit criteria and AP updates for the remaining useful segments of the project.

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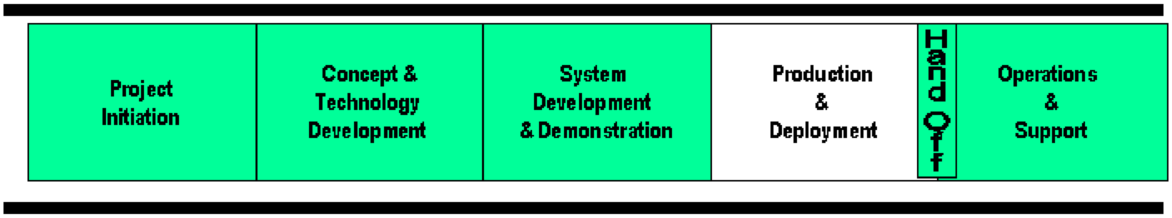

d. Production and Deployment Phase

The Production & Deployment (P&D) Phase activities produce systems and equipment for deployment into operational use. The objective of the P&D phase is to achieve the full operational capability that satisfies the mission need. Asset(s) are produced and deployed in lots or blocks, each of which is a programmatically and economically useful segment. The necessary logistics systems are in place to support the end-items. Each operating unit is readied for unrestricted operations and deployment. The Sponsor disposes the items replaced or made obsolete by the newly deployed assets.

(1) Phase Objectives

- Establish a stable, efficient production and support base.
- Achieve an operational capability that satisfies the mission need.
- Conduct follow-on testing to confirm and monitor performance and quality and verify correction of deficiencies (as necessary).
- Produce and test systems and transition into system deployment.
- Ensure logistics are in place to support end-items.
- Make each operating unit ready for unrestricted operations and complete the hand-off to the Operational Commander.

(2) Phase Activities

- Execute the production contract(s).
- Logistics:
  - ♦ Ensure that the proper personnel, all training facilities and all logistic support material and facilities are in place.
  - ♦ Package and distribute all technical data to each unit and logistic support organization.
  - ♦ Review and update, as necessary, the ILSP.
  - ♦ Prepare for the hand-off of the operational system.
- Manage product configuration.
- Conduct Follow-on Operational Test and Evaluation (FOT&E), as necessary.

- Conduct acceptance tests and trials upon delivery.
- Prepare the Project Termination Plan (PTP) and execute project termination and closeout.
- Document Lessons Learned.

(3) Required Accomplishments

Listed below are the minimum required accomplishments for the Production and Deployment Phase.

- Produce and deploy the items or systems.
- Revalidate EIA and update documentation as necessary.
- Execute operational and support plans.

(4) Phase Documentation

The documentation requirements for the Production & Deployment Phase, when discretionary KDPs are required for follow-on production blocks, are prescribed in Table 2-9.

(5) Phase Reviews

CGARC reviews will be conducted for each follow-on Production Block KDP (3A, 3B, etc.).

(6) Phase Approvals

The AE will, for each follow-on Production Block KDP (3A, 3B, etc.):

- Approve and authorize entry into the follow-on Production Block.
- Specify the requirements for future key decision reviews, exit criteria and project documentation updates for the remaining useful segments of the project.

Post-Key Decision Point 3 Documentation (KDP 3A, 3B, etc.)			
Document		**Preparation**	**Approval**
• Mission Need Statement (MNS)	R	SR	G-CV
• Acquisition Plan (AP)	R	PM	G-CV
• Project Management Plan (PMP)	R	PM	G-CCS
• Operational Requirements Document (ORD)	R	SR	G-CCS
• Acquisition Project Baseline (APB)	R	PM	G-CV
• Test & Evaluation Master Plan (TEMP)	R	PM	G-CCS/ G-CV
• Integrated Logistics Support Plan (ILSP)	R	PM	G-CCS
• Configuration Control Board (CCB) Charter	R	PM	G-CCS
• Cost Analysis (LCCE/CBA)	R	PM	G-CCS
• Deployment Plan (DP)	U	SR	S
• Project Termination Plan (PTP), within 12-18 months of last production unit	X	PM	G-A
• Exit Criteria, if follow-on Production Blocks are required	X	PM	G-CV
• Acquisition Phase Summary (APS)	X	PM	N/A

Key			
X	Prepare	PM	Project Manager
U	Update	SR	Sponsor's Representative
R	Revalidate		

Table 2-9, Post-Key Decision Point 3 Documentation

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3. Roles and Responsibilities

a. Coast Guard Acquisition Executive

The Vice Commandant of the Coast Guard by delegation from the Commandant is the Coast Guard Acquisition Executive (AE). The AE oversees the establishment and execution of Coast Guard major acquisition process policy. The AE's responsibilities include:

- chairing the Coast Guard Acquisition Review Council;
- designating projects as Coast Guard major or intermediate acquisitions;
- reviewing project status at specified major milestones; i.e., Key Decision Points (KDPs);
- making key decisions for major acquisitions, including Mission Need Statement (MNS) approval, and identifying the next action(s) that need to be accomplished;
- determining which projects require independent oversight of Operational Test and Evaluation (OT&E);
- approving project decision documents;
- approving project planning documentation—this authority is delegated to Commandant (G-CCS), Commandant (G-A) and/or the Sponsor;
- overseeing the acquisition process;
- designating and chartering the Project Manager (PM)—this authority is delegated to Commandant (G-CCS); and
- determining and implementing training and experience requirements for PMs—this authority is delegated to Commandant (G-CCS), Commandant (G-A), and Commandant (G-W).

b. Coast Guard Acquisition Review Council

The CGARC is an advisory body on major acquisitions for the AE. The primary function of the CGARC is to review major acquisitions at each key decision point. CGARC reviews ensure Coast Guard top management's commitment to the acquisition strategy and plans of the project. The CGARC also serves as a forum to discuss project issues and resolve problems that need to be addressed by Coast Guard top management.

The CGARC:

- Analyzes project cost, schedule, and technical progress, accomplishments, and future plans to determine if the project is prepared to go forward for AE approval;
- Reviews project decision documents and select planning documentation prior to submission to the AE and/or the Chief of Staff; and
- Recommends approval or disapproval to the AE for all key decisions.

The CGARC consists of the members shown in Figure 2-8. CGARC membership includes all participants necessary to comply with review requirements prescribed by legislation and regulation. For example, participation of:

- The Chief of Finance and Procurement (G-CFP) satisfies the Chief Financial Officers (CFO) Act requirement for CFO and the Federal Acquisition Regulation requirement for Competition Advocate oversight of acquisitions;
- The Director of Resources (G-CRC) represents the Coast Guard Investment Board and satisfies the capital programming executive review requirement of OMB Circular A-11; and
- The Director of Information and Technology (G-CIT) satisfies the Clinger-Cohen Act requirement for Chief Information Officer (CIO) oversight of information technology acquisitions.

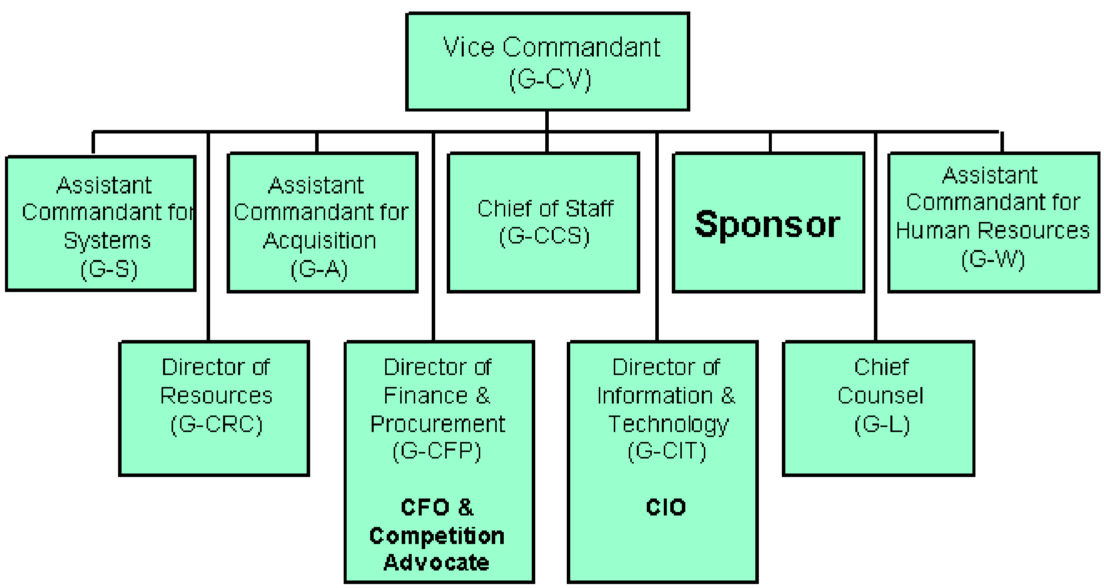

Figure 2-8, Coast Guard Acquisition Review Council

c. CGARC Executive Secretary

Chief, Acquisition Technical Support Staff, Commandant (G-A-2), is the CGARC Executive Secretary. The Executive Secretary:

- Serves as the point of contact for all issues and documentation submitted to the AE for information and/or action, and coordinating reviews by the CGARC members;
- Serves as the CGARC liaison to other Headquarters Boards, e.g., Investment Board, Information Technology Review Board, for issues affecting major acquisitions;
- Monitors project progress and process compliance;
- Identifies issues to be raised to the CGARC;
- Receives, distributes and coordinates acquisition project documentation requiring CGARC review;
- Schedules CGARC meetings and provides administrative support; and
- Prepares Acquisition Decision Memoranda for AE signature.

Chapter 3

REQUIREMENTS MANAGEMENT PROCESS

1. Background

This chapter describes the procedures necessary to identify operational mission needs; to define the operational requirements for system(s) capable of meeting those needs; and to establish the necessary steps for the system(s) deployment.

a. Requirements Evolution

Mission requirements evolve from mandates and policy and can be viewed from broad program related needs through more specific program mission requirements to the most specific level of system specifications, which can be used to define Coast Guard resources. The evolution of program requirements begins with broad descriptions of mission functional capabilities, which are refined as the project progresses, see Figure 3-1. Business planning is a continuous process, employed by Program Directors, to monitor, measure and evaluate the execution of mission requirements. Business planning will identify the deficiencies (gaps) that exist between the current Coast Guard functional capabilities and the required capabilities of current or projected missions. Business planning must carefully consider information technology interoperability (data, information, material, and services) when defining the new requirements to fill the identified gaps. A Mission Need Statement (MNS), derived from the business planning activities, describes specific functional capabilities required to accomplish Coast Guard missions, which cannot be met with non-material solutions.

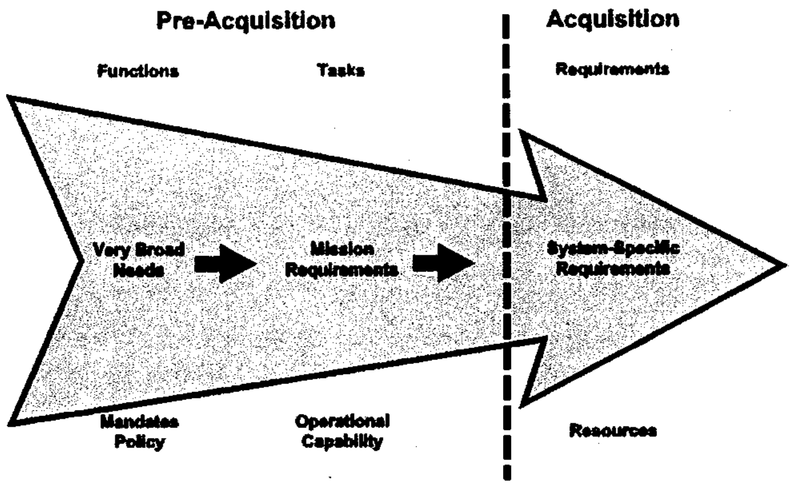

Figure 3-1, Requirements Continuum

b. Requirements Documentation

The Preliminary Operational Requirements Document (PORD) and Operational Requirements Document (ORD) are formal documents which provide a bridge between the operational requirements spelled out in the MNS and the detailed technical requirements found in the specification which will govern development of the system. They are the transition from operational mission needs to "system" or hardware/software solutions. The PORD, derived from the Mission Need Statement, identifies requirements in terms of the range of minimum thresholds and operationally effective goals needed to develop and evaluate alternative system design concepts; and evolves into the ORD. Using the PORD, and working closely with the Sponsor's Representative, the Project Manager conducts or manages feasibility studies and/or trade-off studies to assist the Sponsor in establishing feasible, cost effective requirements in the ORD. The ORD is a top-level document, which establishes the minimum acceptable standards of performance (thresholds) and optimum performance objectives (goals) for the system and sets goals to define an operationally effective system.

c. Requirements Traceability

As a project progresses from business planning, where gaps in capability are identified, through the MNS, where functional capabilities to perform the identified missions are defined, there must be a distinct linkage, or traceability, between the two. The concept of requirements traceability is shown in Figure 3-2. This traceability must then be carried through the complete requirements development process as we progress through the PORD/ORD, into development of the system specification, and finally obtain the resulting contract deliverable. Deployment planning, done well in advance of the delivery of the contract deliverable, addresses aspects of product delivery and the disposal of legacy assets to ensure a smooth transition from acquisition project to fielded asset. Each operational and technical capability of the final product can thus be traced back through the requirements development process.

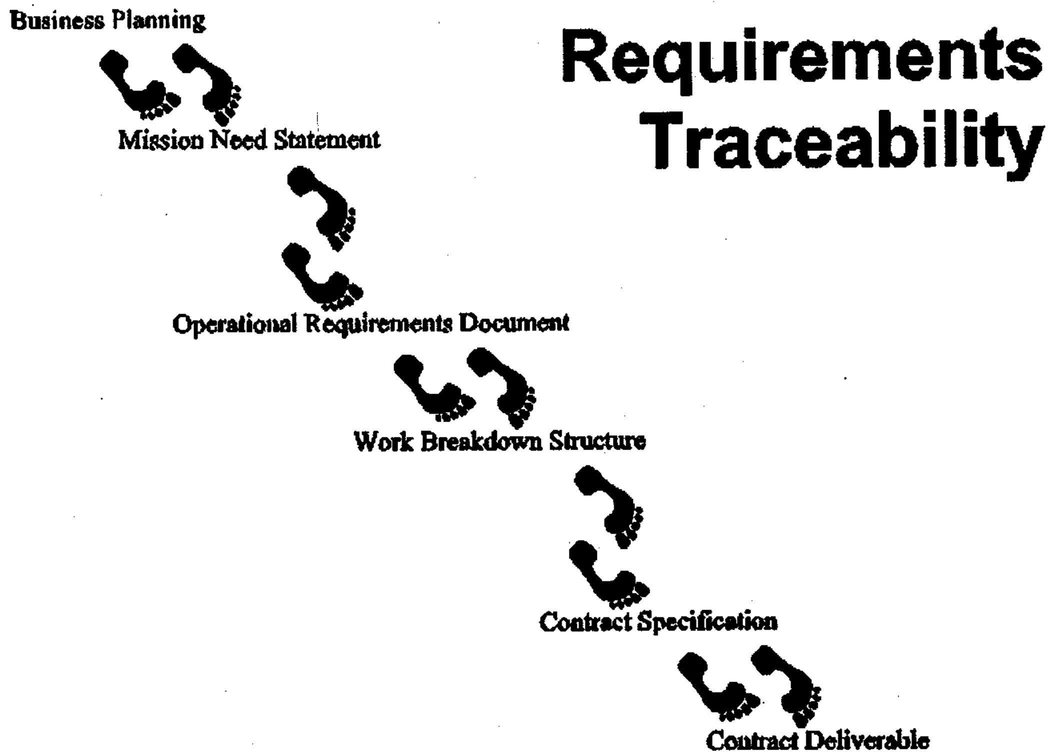

Figure 3-2, Requirements Traceability

2. Roles and Responsibilities

Specific roles and responsibilities applicable to project initiation, requirements development and management and deployment planning are included later in this chapter in the appropriate sections.

a. Project Sponsor and the Sponsor's Representative

During Project Initiation, the Vice Commandant as the Acquisition Executive (AE) designates the Assistant Commandant who has the primary need for the system as the project Sponsor in a Major Acquisition Project Charter. The Sponsor may be either an Operating Program Director (OPD) or a Support Program Director (SPD). The Sponsor has the primary responsibility for managing the requirements development process during an acquisition. The Sponsor's Representative, designated by the AE, is the "owner" for operational requirements and issues of the project and is actively engaged in all project activities throughout the acquisition process. The Sponsor's Representative is the Project Manager's (PM's) point of contact with the operating forces. Additionally, the Sponsor/Sponsor's Representative is responsible for the Deployment Planning process. A **single** Program or Support Manager will serve as the Sponsor's Representative in the acquisition process.

b. Support Program Directors and Support Program Managers

Support Program Directors (SPD) and Support Program Managers (SPM) provide expertise in their functional areas and are consulted during the requirements management process. SPDs and SPMs may also have responsibilities during the acquisition and sustainment phases. Each SPD, an Assistant Commandant for a Support Directorate, is responsible for the efforts of one or more Support Programs. As an example, G-S is responsible for establishing and providing policies, standards, guidelines and best practices for the elements of integrated logistics to be applied to acquisition and sustainment. G-S directs the SPMs responsible for naval engineering ((Commandant (G-SEN)), aeronautical engineering (G-SEA), civil engineering (G-SEC), electronics systems (G-SCE), computer systems (G-SCC), communications systems (G-SCT) and logistics systems (G-SLS). For major acquisitions involving software or information technology, Commandant (G-CIT), the Coast Guard's Chief Information Officer (CIO) will be included as an SPD. During the requirements management process, an SPM may be tasked by the Sponsor or the PM to provide technical support in a particular area of expertise, and/or to conduct feasibility and trade-off studies to help refine requirements.

c. Commandant (G-A)

G-A is responsible for conducting major acquisitions of Coast Guard assets and platforms. G-A serves as Project Director for projects assigned and as such is responsible for ensuring that projects are well planned, effectively executed, and conform to established policies and procedures.

- Commandant (G-A-2), the Acquisition Technical Support Staff, serves as the principal advisor to Commandant (G-A) concerning acquisition policy, procedures and business practices. The Staff Chief is responsible for assisting and providing advice to Sponsors and Sponsor's Representatives in identifying operational mission needs and defining operational requirements.
- By Charter, the Project Manager is responsible for attaining established project cost, schedule and system performance objectives. The detailed responsibilities of the Project Manager are presented in Chapter 4.

3. Requirements Relationship to Acquisition Management and Budget Processes

The major acquisition decision-making process of translating operational needs into stable, affordable acquisition projects consists of three parameters:

- Requirements Management.
- Resource Planning and Management.
- Acquisition Management.

This section discusses the relationship of requirements generation to resource and acquisition management.

a. Requirements Development and Budget Coordination

Operational requirements are the linkage between resource planning and management (the budget process) and acquisition management. Coast Guard needs are identified through business planning and program evaluations, and documented in the integrated Coast Guard Business Plan Appendix B, Capability Requirements; information technology requirements to support each Directorate's needs are defined in Appendix F. Appendices B and F support the development of the Coast Guard's Long Range Plan (LRP), which is Appendix D of the Agency Capital Plan (ACP). The LRP forecasts general capital needs twenty or more years into the future and provides the basis for out-year capital asset decisions that consider obsolescence of platforms, increases in operating and maintenance costs, and the results of analysis and special studies. All capital assets are included in the LRP, i.e., cutters, boats, aircraft, shore plant, equipment and IT assets. Given the lead-time of several years to develop the necessary plans and obtain Acquisition Execution stage funding for capital assets, potential major acquisitions should be identified in the LRP at the earliest opportunity. Nominally, potential major acquisitions must be identified in the fifth year (FY XX +4) of the Five Year Capital Investment Plan, Appendix C of the ACP.

Following the review by the Investment Board and the Chief of Staff's approval of the ACP, the Sponsor, with assistance of the Acquisition Technical Support Staff, Commandant (G-A-2), will generate a Project Nomination Proposal (PNP) for each project included in the Five Year Capital Investment Plan that meets the major acquisition designation criteria. Project initiation represents the convergence of requirements, resources, and acquisition management. The Mission Need Statement (MNS) is an enclosure to the PNP and discusses the potential project's affordability. The affordability assessment addresses the legacy asset life cycle cost estimate, the potential project's affordability and the source, amount and timing of initial funding, including project staffing resources. Concurrently with the development of the PNP, the Sponsor in consultation with Commandant (G-A-1) will prepare a Resource Proposal (RP) for the initial project funding and staffing. Further discussion of the resource management process is provided in Chapter 5.

b. Requirements Development and Acquisition Management Coordination

As indicated in Figure 3-3, acquisition management begins with a broad field of possible solutions for the operational need documented in the MNS and concludes with the selection of a single alternative. This systematic analysis will yield a stable and affordable solution meeting operational needs.

Following MNS approval and the formal initiation of acquisition management, the PORD will be developed early in the Concept and Technology Development phase. Through cost analysis and trade-off studies, project requirements are finalized in the ORD. The ORD shall be completed by the end of the Concept and Technology Development Phase (KDP 2). If a discretionary KDP 1A is required, the PORD will be prepared for approval at that time.

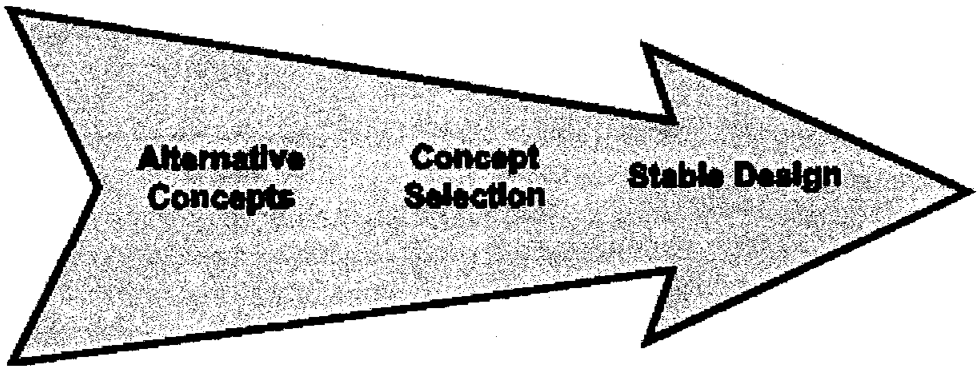

Figure 3-3, Acquisition Management

Finalizing project requirements (i.e., establishing the project ORD) in a timely manner is key to success. The failure to bound requirements impacts:

- **Acquisition Strategy Development** - requiring multiple alternatives to be carried forward for further examination.
- **Budget Development** - requiring the resource requirements profile to be stretched over a longer period of time; increasing costs due to inflation and exploring additional alternatives.
- **Schedule Development** - requiring the project duration to be stretched over a longer period of time due to the increased number of activities required to explore additional alternatives.

4. Project Initiation

a. Purpose

This section addresses the steps required to define a capability gap and initiate a major acquisition. A discussion of the documentation pertaining to business planning, identifying mission need(s), major acquisition nominations and proposals, and the AE designation of a major acquisition through a formal charter is included. This section sets the requirements and establishes procedures for the preparation of the Project Nomination Proposal (PNP) and the Mission Need Statement (MNS). MNS review and approval procedures are prescribed as well.

b. Discussion

(1) Business Planning

The Coast Guard business planning process requires continual assessment and review of mandates, missions, requirements and strategies to ensure the proper balance between performance, capabilities and cost. Through the business planning process, Program Directors monitor performance and mission accomplishment; identify changing mission needs; anticipate new missions and identify the approaching obsolescence of assets. During the analysis, non-material solutions to capability gaps are examined. Non-material solutions are remedies other than asset acquisition, modification or renovation, and include changes in policy, procedures, training, etc. The analysis conducted during the business planning process provides the justification for either a "non-material" solution or a new acquisition. Program Directors' inputs to the Coast Guard's Business Plan provide "snapshots" of their planning and are guided by the Department of Transportation (DOT) and Coast Guard Strategic Plans. Directorate input identifies gap(s) between prospective mission needs and current capabilities and feeds the Agency Capital Plan (ACP).

(2) Project Nomination Proposal

The PNP documents a proposed major acquisition for AE consideration and is submitted for AE approval in order to initiate a major acquisition. The PNP consists of a decision memorandum with the MNS as an enclosure.

(3) Mission Need Statement

The purpose of the MNS is to describe specific functional capabilities required to accomplish Coast Guard missions. The MNS is normally derived from a quantified, well-documented, objective business case, summarizes the results of thorough analysis and bounds the scope of the project. The MNS approval provides formal Coast Guard executive level acknowledgment of a justified and supported need to allocate scarce resources to resolve a mission deficiency.

Approval of the MNS represents the initiation of formal acquisition project management.

(4) Major Acquisition Project Charter

The Major Acquisition Project Charter (MAPC) transmits AE approval of the PNP and designation as a major acquisition. Recommendations included in the PNP are addressed in the MAPC. The issuance of a MAPC along with the approval of the MNS constitutes Key Decision Point (KDP) 1 approval.

c. Roles and Responsibilities

The primary responsibility for project initiation and the development of the appropriate analysis and documentation lies with the Sponsor organization with input from other Coast Guard programs. Specific roles and responsibilities are as follows:

(1) Program Director/Sponsor

- Conducts business planning and documents results in annual Business Plans.
- Directs the Program Manager/Sponsor's Representative to prepare the MNS, a KDP 1 CGARC presentation and a PNP (with the MNS enclosed).
- Submits the MNS for CGARC review and the overall PNP for AE approval.
- Recommends in the PNP decision memorandum a Program/Support Manager (Office Chief) to serve as the Sponsor's Representative in the acquisition process.
- Prepares an initial Resource Proposal (RP) for initial project funding and staffing.

(2) Program Manager/Sponsor's Representative

- Prepares the MNS and the PNP (with the MNS enclosed).
- Prepares the KDP 1 CGARC presentation.

(3) Support Program Directors and Support Program Managers

- Reviews and comments on the MNS.

(4) Acquisition Program Director

- Commandant (G-A) serves as the Project Director.
- Reviews and comments on the MNS.

(5) Acquisition Technical Support Staff

- Commandant (G-A-2) acts as the Acquisition Directorate point of contact.
- Provides advice and assistance to Sponsors with business planning and MNS development.
- Reviews and comments on the MNS.
- As the CGARC Executive Secretary, prepares the MAPC for the AE.

d. Major Acquisition Initiation Procedures

The following outlines the steps and procedures in order to initiate a major acquisition:

- Based on the business plan and resource estimates, the Program Director or Sponsor, with the assistance of Commandant (G-A-2), will prepare a MNS in accordance with Exhibit 3-1. To provide the opportunity to assess the priority and affordability impacts of the potential project with respect to the current Agency Capital Plan, Commandant (G-CPA) and/or (G-CIT) need to provide input during development of the MNS. The Sponsor's Representative shall circulate the MNS for concurrent clearance in accordance with procedures in Chapter 6.
- Following the completion of the concurrent clearance process, the Sponsor's Representative will prepare a KDP 1 briefing for presentation to the CGARC. The briefing should be prepared as prescribed in Chapter 6.
- Concurrently, the Sponsor prepares a PNP decision memorandum, which briefly identifies the mission need and cites justification. The PNP will recommend designating the project as a major acquisition (should the project be designated as an intermediate acquisition, the project will be planned and executed in accordance with the Coast Guard Non-Major Acquisition Process). Additionally, the decision memorandum contains recommendations for designating the Project Sponsor, the Sponsor's Representative, establishing a Commandant (G-A) project management office and approval of the MNS. A description and format of the PNP decision memorandum is contained in Exhibit 3-2.
- Following the KDP 1 CGARC briefing, the PNP (the decision memorandum with the MNS enclosure) is submitted to the AE via the CGARC Executive Secretary and the Chief of Staff. The CGARC Executive Secretary's endorsement provides a procedural and format review and includes administrative actions required for a KDP 1 approval. The Chief of Staff's review of the PNP provides the opportunity to review potential project impacts on Coast Guard organizations and resources as well as guidance and input for approval.

- The AE will review the presented material and, if a major acquisition is justified, approval of the PNP is transmitted through the AE's issuance of a MAPC, shown as Exhibit 3-3. The MAPC combined with the approval of the MNS constitutes a KDP 1 decision and formal establishment of the project.

e. Mission Need Statement Revalidation

After reviewing business plan documentation and assessing current mission needs, the Sponsor shall revalidate the MNS at each KDP and update whenever a change to the mission need is identified.

f. Mission Need Statement Updates

- When updates to the initial MNS are provided, the revision number and date (e.g., Revision 1, 01 Jan 2001) shall be indicated on the bottom of each page. When a page change is provided, an indicator bar shall be placed in the margin to identify the change.
- Updated MNS are prepared by the Sponsor's Representative in accordance with Exhibit 3-1 and shall be circulated for concurrent clearance in accordance with procedures in Chapter 6. The Project Director (Commandant (G-A)), the Acquisition Technical Support Staff (Commandant (G-A-2)), and the Project Manager as well as the Support Program Director and the Support Program Manager will review and comment on any MNS update. For a MNS update, a presentation to the CGARC may be required. The updated MNS will be approved by the AE.

g. Other Information

Additional documentation information is available on the Commandant (G-A-2) Headquarters Intranet Web Site at http://cgweb.comdt.uscg.mil/G-A-2/pages/main.html.

SAMPLE MISSION NEED STATEMENT

Cover Page

Mission Need Statement (MNS)
for the

PROJECT TITLE

Submitted by: ______________________ ______________
Sponsor (G-X) Date

Approved: ______________________ ______________
Acquisition Executive (G-CV) Date

Sample Mission Need Statement

Table of Contents

Mission Need Statement

Content Requirements

1. General

The MNS should describe specific functional capabilities required to perform Coast Guard missions. The outline below provides the required MNS format and describes the content of each section.

2. Contents

Executive Summary

Summarize the salient points of the MNS.

Section A. Description of the Mission(s) and Capabilities

1. Required Mission(s) and Need(s)

Identify the required mission(s) in functional terms and capabilities. Do not specify in terms of equipment or other means which might satisfy the need; i.e., state the problem (need) not the solution (equipment). If a current mission has changed, discuss how or what portion of the mission(s) will be changed and how current capabilities are going to differ as a result of satisfying this mission need.

2. Authority

Cite the statutory and/or regulatory authority for the mission(s).

3. Capability Gap

Describe the difference in the current capability versus future needs. Assess why it is not possible to perform this mission(s) with existing capabilities and resources.

Section B. Project Justification

1. Planning Linkage

Link or trace the defined mission(s) to the Department of Transportation (DOT) and Coast Guard Strategic Plans, the appropriate Directorates Business Plan(s) and the Coast Guard's Agency Capital Plan (ACP).

2. Compelling Federal Government Interests

State why investment in a major capital asset will support core/priority mission functions that need to be performed by the Federal Government and why the investment needs to be undertaken by this agency as opposed to another governmental source or private sector alternative.

3. Efficiency and Effectiveness

Discuss how this investment will support work processes that have been simplified or otherwise redesigned to reduce lifecycle costs, improve effectiveness, and make maximum use of commercial, off-the-shelf technology.

4. Disapproval Impact

Briefly discuss the impact of not approving the project and include impacts on current and planned mission(s) and capabilities.

Section C. Project Boundaries

1. Proposed Acquisition Alternatives

Briefly discuss the range of acquisition alternatives to be considered.

2. Acquisition Constraints

Discuss any known constraints such as: budget, schedule, operational, logistics, maintenance, or safety considerations. For Information Technology (IT) systems consider supportability, data sharing and interoperability needs in the operational environment. The timing of the need for the planned capability will be addressed and an Initial Operational Capability (IOC) date will be stated.

3. Acquisition Goals and Objectives

Discuss the acquisition strategy objectives, e.g., developmental or non-developmental; risk reduction or transfer, timely deployment; reduce life cycle costs; standardize inventories; improve reliability; maximize use of current Coast Guard infrastructure, logistics system, etc.

Section D. Resources

1. Total Acquisition Cost

Provide a rough-order-of-magnitude estimate of the total acquisition costs for the project.

2. Priority/Affordability

In coordination with Commandant (G-CPA) and/or (G-CIT) indicate the general priority of this mission and the planned capability relative to other missions and Coast Guard programs. Include a summarized comparison to estimated legacy asset lifecycle costs. State whether or not the mission capability is included in the ACP and discuss what impact the project will have in future budget years.

3. Other Government Agencies

Indicate if other governmental agencies are involved or impacted.

Section E. Major Acquisition Designation Criteria

With the assistance of Commandant (G-A-2), assess the following major acquisition designation criteria, in Table 3-1, and discuss the potential risks for the overall project that justify top management attention and formal G-A project management.

Major Acquisition Designation Criteria
• Programmatic risks
• New requirement vs. repetitive/replacement
• Technological Risk
• Magnitude of Life Cycle and/or Acquisition Costs
• Cross-organizational management requirements
• Project management requirements
• Logistic support requirements
• Information technology interoperability requirements
• Impact on other Coast Guard projects
• DOT Intermodal implications
• Public sensitivity/visibility
• Need for direct AE oversight

Table 3-1, Major Acquisition Designation Criteria

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Project Nomination Proposal

U.S. Department of Transportation
United States Coast Guard

Memorandum

Subject:	**(PROJECT NAME)** PROJECT NOMINATION	Date:	**XX XXX XX** 5000
From:	Assistant Commandant for **(Sponsoring Organization)**	Reply to Attn. of:	G-**XXX** **Sponsor's POC** 267-**XXXX**
To:	Vice Commandant		
Via:	(1) CGARC Executive Secretary (2) Chief of Staff		
Ref:	(a) Major Systems Acquisition Manual, COMDTINST M4150.2F		

1. **Purpose.** To nominate the **(Project Name)** as a major acquisition in accordance with reference (a).

2. **Mission Summary and Need.** Briefly cite business planning activities and concisely identify the mission need.

3. **Recommendations.** In accordance with reference (a), I recommend:

   a. the **(Project Name)** be designated a major acquisition;

   b. the **(Sponsoring Organization)** be designated as a Project Sponsor (for cross-functional projects involving more than one Program Director, a single Sponsor shall be recommended);

   c. the **(Sponsor's Program Manager)** be designated as the Sponsor's Representative;

   d. establishing a project management office within the Acquisition Directorate (G-A);

   e. approval of the enclosed Mission Need Statement (MNS); and

   f. authorization to proceed into the Concept & Technology Development Phase.

Encl: **(Project Name)** Mission Need Statement (MNS)

Copy: G-A (Others as necessary)

Major Acquisition Project Charter

U.S. Department of Transportation

United States Coast Guard

Memorandum

Subject:	**(PROJECT NAME)** MAJOR ACQUISITION PROJECT CHARTER	Date:	**XX XXX XX** 5000
From:	Vice Commandant	Reply to Attn. of:	G-A-2 **(CGARC Ex. Sec.)** 267-0461
To:	Assistant Commandant for **(Sponsoring Organization)**		
Ref:	(a) Major Systems Acquisition Manual, COMDTINST M4150.2F (b) Your Memo of **XX XXX XX**		

1. In accordance with reference (a), reference (b) is approved. The **(Project Name)** is:
   a. designated as a major acquisition;
   b. the Mission Need Statement (MNS) is approved; and
   c. authorized to enter into the Concept and Technology Development Phase.

2. The Assistant Commandant for **(Sponsoring Organization)** is designated as the Project Sponsor with the **(Sponsor's Program Manager)** designated as the Sponsor's Representative.

3. The Project Sponsor will be responsible for:
   a. validating the MNS throughout the duration of the project;
   b. submitting a Preliminary Operational Requirements Document (PORD) via the Project Manager to Commandant (G-A) for acceptance;
   c. submitting a Operational Requirements Document (ORD) for CGARC review and Chief of Staff approval;
   d. submitting an Operational Test and Evaluation (OT&E) Report for CGARC review and approving the OT&E Report; and
   e. participating as a CGARC member for **(Project Name)**-related issues.

4. The Assistant Commandant for Acquisition (G-A) is directed to select a Project Manager and establish a project management office within the Acquisition Directorate. Within 6 months, the G-A Project Manager will submit an Acquisition Strategy Proposal (ASP), Project management Plan (PMP), and Concept & Technology Development Phase Exit Criteria for approval.

5. Within 6 weeks, the Project Sponsor and Commandant (G-A) will jointly provide Commandant (G-CCS) a resource plan to support project start-up activities until project specific resources are appropriated.

CGARC Distribution: G-CCS G-CRC G-CFP G-CIT G-A G-L G-S G-W
Copy: (Others as necessary)

5. Operational Requirements Documents

a. Purpose

This section sets the requirements and establishes procedures for preparation of a Preliminary Operational Requirements Document (PORD) and an Operational Requirements Document (ORD) and prescribes procedures for PORD/ORD review and approval. These procedures apply to major acquisition projects.

b. Discussion

(1) Background

The ability of the Coast Guard to acquire major systems that meet operational mission needs within cost and schedule constraints begins with the establishment of operational performance requirements. The accurate definition of requirements by the Sponsor is imperative if the major acquisition is to be completed within cost and schedule constraints and still meet the Sponsor's mission performance needs. The Sponsor establishes absolute minimums (thresholds) below which the mission can not be successfully performed. The Sponsor also sets goals to define an operationally effective system. The PORD/ORD process then optimizes the various requirements through trade-off analyses.

(2) Function of the PORD/ORD

The PORD and ORD are formal documents which provide a bridge between the operational requirements spelled out in the MNS and the detailed technical requirements found in the specification which will govern development of the system.

(a) PORD

The PORD identifies requirements in terms of the range of minimum thresholds and operationally effective goals needed to develop and evaluate alternative design concepts. It evolves into the ORD. The PORD is derived from the Mission Need Statement and early mission analysis. Developed early in the Concept and Technology Development Phase, the PORD describes the missions, operational capabilities, operating environment, and system constraints, which competing system concepts must satisfy. Using the PORD, and working closely with the Sponsor's Representative, the Project Manager conducts feasibility studies and/or trade-off studies, either in-house or through contractor(s). The functional requirements are analyzed, system concepts synthesized, concepts evaluated (in terms of cost, mission and environmental impacts), and the best system concept(s) selected and described. The optimum capabilities resulting from the trade-off analyses are documented in the ORD.

(b) ORD

The ORD is a top-level document which establishes the minimum acceptable standards of performance (thresholds) and optimum performance objectives (goals) for the system and serves as a "contract" between the Sponsor and the acquirer, Commandant (G-A). It is important that the PORD and ORD be carefully developed and that they accurately reflect the Sponsor's requirements. After the ORD is approved, changes should be minimal and must be well justified before being implemented.

(3) Configuration Management during the Requirements Management Process

Configuration Management (CM), the process of documenting and controlling a system's configuration as it proceeds through the design and development process in the various acquisition phases, is discussed in detail in Chapter 4. The system configuration is managed by the Configuration Control Board (CCB), which is established by Commandant (G-CCS) charter after the approval of the PORD, but no later than KDP 2. When a change is proposed in the performance, safety, or reliability, availability, and maintainability requirements of a major system, a corresponding change in its configuration is likely. As a result, the CCB will be an integral part of the review and approval process for ORD revisions.

c. Roles and Responsibilities

The primary responsibility for defining requirements in the PORD and ORD lies with the Project Sponsor, who has the primary need for the system. Specific roles and responsibilities are as follows:

(1) Sponsor

Specifically, the Sponsor:

- Directs the Sponsor's Representative to prepare the PORD/ORD.
- Submits a PORD via the PM to Commandant (G-A) for acceptance.
- Submits an ORD for CGARC review and Commandant (G-CCS) approval.

(2) Sponsor's Representative

As the Program Manager for a specific program, the Sponsor's Representative:

- Prepares a PORD.
- Prepares an ORD.

(3) Support Program Directors

Each Support Program Director (SPD) involved in the particular program:

- Directs SPM(s) to conduct appropriate feasibility studies and trade-off studies.
- Reviews and comments on ORD.

(4) Support Program Managers

Each Support Program Manager (SPM) involved in the particular program:

- Reviews and comments on PORD.
- Conducts and/or manages feasibility studies and/or trade-off studies in area of technical expertise to refine preliminary requirements.
- Reviews and comments on ORD.

(5) Acquisition Program Director

Commandant (G-A):

- Accepts PORD submitted by the Sponsor.
- Directs PM to conduct feasibility studies and/or trade-off studies, as appropriate.
- Reviews and comments on ORD.
- Endorses ORD, and recommends approval by the Chief of Staff.

(6) Acquisition Technical Support Staff

Commandant (G-A-2):

- Acts as the Acquisition Directorate point of contact and provides advice and assistance to Sponsors in the development of the PORD and ORD.
- Reviews and comments on PORD/ORD.

(7) Project Manager

The Project Manager (PM):

- Assists the Sponsor's Representative in defining the operational and support requirements for the system.
- Reviews and comments on PORD.

- Endorses PORD submitted by Sponsor and recommends acceptance by Commandant (G-A).

- Conducts or manages feasibility studies and/or trade-off studies, as appropriate, to help refine requirements.

- Reviews and comments on ORD.

- Endorses ORD submitted by Sponsor and recommends endorsement by Commandant (G-S), Commandant (G-CIT), Commandant (G-A), and approval by the Chief of Staff.

d. Procedures

(1) Preliminary Operational Requirements Document

(a) Preparation

1. Sponsor and Acquisition Directorate Roles

As soon as the Mission Need Statement (MNS) has been submitted for approval through the CGARC process, the Sponsor's Representative should begin preparation of the Preliminary Operational Requirements Document (PORD). The PORD amplifies the information contained in the MNS. The Sponsor's Representative should consult with Commandant (G-A-2) and the PM as early in the process as possible. Commandant (G-A-2) and the PM shall take an active role in coordinating review of the PORD.

2. Headquarters Coordination

The PM and the Sponsor's Representative shall consult with those Headquarters Offices/Staffs that will be involved in the matrix tasking of the acquisition, including Program Managers other than the Sponsor's Representative who have mission requirements noted in the MNS for the project. This process will be iterative; it is recommended that the final iteration be a Matrix-level Concurrent Clearance review. After incorporation of comments, the resultant product will be a PORD, which accurately reflects the Sponsor's requirements and the PM's acquisition concerns.

(b) Acceptance

The completed PORD shall be signed by the Sponsor and forwarded to Commandant (G-A), the Project Director, via the PM, as shown in Figure 3-4. Upon receipt and acceptance (by signature) by Commandant (G-A), the PORD provides the requirements boundaries, which the PM will use to conduct feasibility studies and trade-off analyses to develop and evaluate alternative system design concepts. The accepted PORD shall be in place not later than six months after KDP 1. **If the PORD will be used to support KDP 1A, the preparation, clearance, and approval sequence of the PORD shall follow the process required for the ORD in section 3.5.d(2)(b) below.**

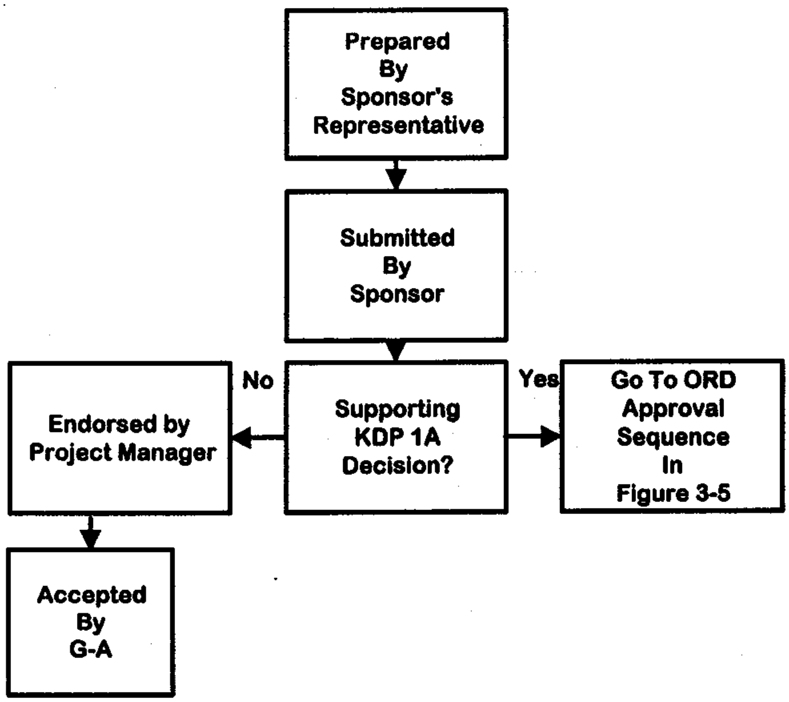

Figure 3-4, Preliminary Operational Requirements Document Routing/Approval Sequence

(2) Operational Requirements Document

(a) Preparation

Based upon the results of the feasibility studies and trade-off studies, the Sponsor's Representative revises and clarifies the PORD to become the formal Operational Requirements Document (ORD). ORD development is an evolutionary process flowing from the PORD and should be prepared in consultation with the same Program and Support Managers involved in the development of the PORD in order to insure that all mission needs and requirements have been properly addressed. Based upon the above studies, the Sponsor's Representative will also need to identify critical test and evaluation issues (i.e., Critical Operational Issues). As with the PORD, it is recommended that the final iteration of ORD preparation be a Matrix-level Concurrent Clearance review.

(b) Approval Sequence

1. Concurrent Clearance

Following resolution of issues raised during the Matrix-level Concurrent Clearance, and with the concurrence of the Sponsor, the Sponsor's Representative shall forward the completed ORD to the CGARC Executive Secretary (G-A-2) for Concurrent Clearance distribution to the CGARC members. For purposes of defining requirements, expansion of the CGARC should be considered to include all affected Program Directors, to insure that no requirements are overlooked or omitted.

2. Approval

Upon resolution of issues raised during the CGARC Concurrent Clearance process, the ORD is forwarded for approval to Commandant (G-CCS), as shown in Figure 3-5. The ORD, initiated and endorsed by the Sponsor, must go through the Chief Information Officer, Commandant (G-CIT) and Commandant (G-S) for technical endorsement; the PM (acting as Chairman of the CCB); Commandant (G-A) for an acquisition endorsement; and Commandant (G-CCS) for approval. If all issues cannot be resolved through the normal Concurrent Clearance process, any CGARC member may request a formal CGARC to resolve outstanding issues. If supporting a KDP, the ORD will be forwarded for approval following the KDP CGARC meeting. Upon approval by Commandant (G-CCS), the ORD defines the mission critical performance parameters that serve as the basis for all subsequent acquisition phases. **The approved ORD shall be in place not later than KDP 2.**

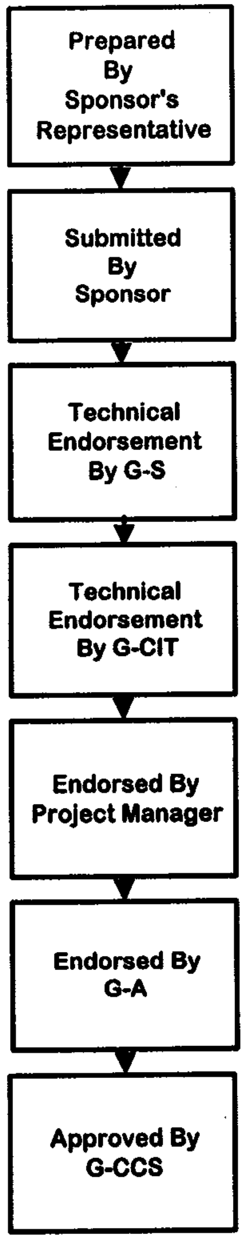

Figure 3-5, Operational Requirements Document Routing/Approval Sequence

(c) ORD Revisions

1. Preparation

It may become necessary during the lengthy acquisition process to revise requirements, often as a result of changing missions, e.g., a change to the MNS. If requirements change, a revised ORD shall be prepared using the same process described in Paragraph 3.5.d(2)(a) above, except that all proposed changes shall be reviewed by the CCB. The CCB shall recommend acceptance or rejection of the proposed change to the Sponsor.

Each revision of the ORD shall be numbered successively for record-keeping purposes. The revision number and date (e.g., Revision 1, Jan 01) shall be indicated on the bottom of each page, and an indicator bar shall be placed in the margin to identify the change.

2. Approval

Review and approval procedures for revised ORDs shall be identical to those for the original ORD, Paragraph 3.5.d(2)(b) above. If changes to the ORD are made, the Acquisition Project Baseline (APB) shall be reviewed for any impact on the APB.

e. Documentation

Exhibit 3-4 presents a sample PORD Cover Page; a sample ORD Cover Page; a sample Table of Contents to be used for both the PORD and the ORD; and content and format requirements for the PORD and the ORD.

Exhibit 3-4

SAMPLE PRELIMINARY OPERATIONAL REQUIREMENTS DOCUMENT

Cover Page

Preliminary Operational Requirements Document (PORD)
for the

PROJECT TITLE

Prepared by:	______________________ Sponsor's Representative (G-XXX)	__________ Date
Submitted by:	______________________ Sponsor (G-X)	__________ Date
Endorsed by:	______________________ Project Manager (G-AXX)	__________ Date
Accepted by:	______________________ Assistant Commandant for Acquisition (G-A)	__________ Date

SAMPLE OPERATIONAL REQUIREMENTS DOCUMENT

Cover Page

Operational Requirements Document (ORD) for the

PROJECT TITLE

Prepared by:	Sponsor's Representative (G-XXX)	Date
Submitted by:	Sponsor (G-X)	Date
Endorsed by:	Assistant Commandant for Systems (G-S)	Date
Endorsed by:	Chief Information Officer (G-CIT)	Date
Endorsed by:	Project Manager (G-AXX)	Date
Endorsed by:	Assistant Commandant for Acquisition (G-A)	Date
Approved by:	Chief of Staff (G-CCS)	Date

Sample Preliminary Operational Requirements Document/ Operational Requirements Document

Table of Contents

Section D. **Critical Technical Parameters**

1. **Basic Requirements**
2. **Communications/Information Technology**
3. **Navigation**
4. **Sensors**

Section E. **Key Performance Parameters (KPP)**

Section F. **Trade-Offs**

Appendices

Sample Preliminary Operational Requirements Document/ Operational Requirements Document

Content Requirements

Section A. Introduction

The introduction provides a project summary and should include a brief reference to each of the following points:

1. Purpose

Define the purpose of the PORD/ORD as it relates to accomplishing specific missions of the Coast Guard. This should flow from and be consistent with the Mission Need Statement (MNS), which should be referenced. If a documented MNS did not precede the PORD/ORD, explain the process that investigated alternatives for satisfying mission need.

2. Background

Provide a brief discussion of the acquisition. Briefly describe the system in general terms, without describing specific hardware requirements. When replacing an existing system, include information on age, service life, maintenance time and costs, and system availability to meet program standards that need to be solved by the replacement system.

3. Timeframe

Identify required timeframes for delivery of the first unit; include justification:

(a) Initial Operational Capability Date

Initial Operational Capability (IOC) is defined as the first attainment of the capability of a platform, system, or equipment. IOC for software is when the minimum capability necessary to field the application is achieved. It must meet approved specific characteristics, be operated by an adequately trained and equipped Coast Guard unit, and effectively perform the required mission. Identify what constitutes the first operational unit for purposes of IOC (e.g., it may be the first ship, aircraft, or radar system for hardware projects; it may be when software is operating in a defined environment, such as the Standard Workstation III operating in the Acquisition Directorate; or it may be when a useable segment of a geographically diverse system such as the Ports and Waterways Safety System (PAWSS) is performing its operational mission in a designated location.) Clearly specify the operational capability or level of performance necessary to declare IOC. It should be noted that IOC does not necessarily represent a "fully capable unit".

(b) Coast Guard Support Date

Coast Guard Support Date (CGSD) is defined as the date when all resources required to support sustained operations and maintenance are in place, either organically or through contract. Clearly specify all logistics support which must be in place to declare attainment of CGSD.

(c) Full Operational Capability Date

Full Operational Capability (FOC) is defined as the delivery of the last platform, system, or equipment. FOC for software is when the application provides the capability to satisfy all ORD requirements. Clearly specify the operational capability or level of performance necessary to declare FOC.

(d) Other

Identify any other important project-specific dates.

Section B. Philosophy

Describe the philosophy which supports the:

1. Design

Identify whether the design is constrained or unconstrained (e.g., parent craft, off-the-shelf, etc.); advanced technology or proven technology.

2. Integrated Logistics Support

Identify integrated logistics support (ILS) requirements and constraints; identify the overall ILS concept for the project. Describe any unusual or known specific support requirements needed for the project, with particular emphasis on those which could drive cost, schedule, or performance.

3. Reliability

Identify reliability requirements; specify the duration or probability of failure-free performance under stated conditions (i.e., the probability that an item can perform its intended function for a specific interval under stated conditions). Reliability requirements are often stated in terms of Mean Time Between Failures (MTBF). In addition to the specification, this section will serve as the basis for a portion of the Integrated Logistics Support Plan (ILSP).

4. Availability

Identify availability requirements; specify the probability that an item is in an operable and committable state at the start of a mission when the mission is called for at unknown (random) times. Availability requirements are often stated in terms of Operational Availability (A_o). In addition to the specification, this section will serve as the basis for a portion of the ILSP.

5. Maintainability

Identify maintainability requirements; specify the measure of the ability of an item to be retained in or restored to specified condition when maintenance is performed by personnel having specified skill levels, using prescribed procedures and resources. Describe any unusual or known maintainability constraints or requirements. Identify any support activities required to maintain the system. Maintainability requirements are often stated in terms of Mean Time to Repair (MTTR). In addition to the specification, this section will serve as the basis for a portion of the ILSP.

6. Survivability

Identify survivability requirements; identify the conditions under which the system is expected to survive a hostile environment (natural or man-made) without suffering an abortive impairment of its ability to accomplish its designated mission(s). Software survivability must address security, fault tolerance, safety, reliability, reuse, performance, verification, and testing to recover from attack, failure and accident.

7. Personnel, Safety, Human Factors, and Environmental Considerations

Identify factors and requirements relating to personnel, safety, human factors, and environmental considerations.

- Identify the current personnel necessary to safely operate, maintain and support a similar existing system.
- Identify any staffing goals or requirements for the system to be acquired.
- Describe, in general terms, the physical (habitability) requirements for personnel (including working, eating, living and sleeping areas, mixed gender considerations, where appropriate).
- Describe any unique personnel or safety requirements such as medical or personal care requirements arising from extended deployment conditions, system redundancy for safety purposes, installed safety-specific capabilities, or post-mishap analysis capability.

- Describe any unique human factors or human engineering requirements, such as human-machine interface or ergonomic requirements.
- Describe any environmental considerations identified in the environmental impact analysis.

8. Training Requirements

Describe the training philosophy required (pipeline, OJT, etc.) to support operational and maintenance concepts to accomplish the mission intended by the system. This section will serve as the basis for a portion of the Integrated Logistics Support Plan (ILSP).

Section C. Mission Requirements

Describe the mission requirements as contained in the MNS.

1. Operating Requirements

In specific terms, describe:

- The operating environment for the system (e.g., open ocean, coastal, sea state, ice cover, etc.).
- The geographic area in which the operations will be performed (e.g., polar regions, Great Lakes, inland rivers, etc.).
- The climatological envelope in which the mission must be performed (e.g., temperature, humidity, windspeed, current, etc.).
- The operational functions which must be performed to execute the mission (e.g., hoisting, towing, interdiction, surveillance, etc.).
- Interoperability requirements necessary to complete each mission area described in the Concept of Operations.

2. Concept Of Operations – Peacetime

Describe <u>operating scenarios</u> envisioned during peacetime. Scenarios should describe each of the anticipated operating schemes in terms of the activities anticipated to be conducted in a typical mission; describe in terms of the activities operational personnel are expected to perform. Examples should include office settings, and shipboard and aircraft settings, as appropriate. The scenarios should be linked to the overall mission which is to be met; i.e., how do the operators of the system go about conducting a typical mission? [As an example, during a Search and Rescue (SAR) mission being conducted by a patrol boat, the operators would be notified of a case, proceed to the search area, conduct the search (possibly with the aid of a small boat which they have deployed), complete a rescue evolution, provide medical attention, and return to the nearest port or rendezvous with an aircraft.]

3. Concept Of Operations - National Emergency

Describe operating scenarios envisioned during periods of national emergency (e.g., wartime, environmental crisis, natural disaster, etc.). Describe all operational scenarios, which exceed the peacetime capabilities described above.

4. Critical Operational Issues

- List the Critical Operational Issues (COIs) for the system. COIs are the operational effectiveness and operational suitability issues (not characteristics, parameters, or thresholds) that must be examined during Operational Test and Evaluation (OT&E) to evaluate/assess the system's capability to safely perform its mission.
- A COI should be phrased as a question that must be answered in order to properly evaluate the operational effectiveness (e.g., Will the system possess sufficient maneuverability [speed, power, and control] to operate in its intended open water environment?) and operational suitability (e.g., Does the system have the reliability, maintainability, and availability characteristics sufficient to meet operational requirements?).
- The list of COIs should be thorough enough to ensure that, if every COI is resolved favorably, the system will be operationally effective and operationally suitable when employed in its intended environment by typical users. The list of COIs should be divided into Effectiveness COIs and Suitability COIs and will normally consist of five to ten issues for each category; they should reflect only those issues that are truly "critical" in nature. Thus, if a COI cannot be favorably resolved, the acquisition should not proceed to production.

Section D. Critical Technical Parameters

Identify and describe critical technical parameters, which must be part of, or met by, the system. Focus on "mission critical" parameters; i.e. those that are required for the system to effectively complete its mission. Avoid trying to design the system or overly constraining the design.

1. Basic Requirements

Describe the system operational capabilities necessary to satisfy mission performance requirements. See Table 3-2 for basic requirements that should be considered for cutters, aircraft, and other systems.

2. Communications/Information Technology

Identify any special or unique requirements for communications or information technology.

3. Navigation

Identify any special or unique navigation requirements.

4. Sensors

Identify any special or unique sensors, which are required.

Cutters & Boats	Aircraft
Length	Speed
Beam	Maneuvering
Draft	Overall Endurance
Speed	On-scene Endurance
Maneuvering	Range
Endurance	Design Life
Range	Maximum Gross Weight
Damage Control	Cargo Capacity
Design Life	Personnel Capacity
Ship Control	Navigation
Seakeeping	Communications
Human Factors	Major Equipment
Safety/Environmental Health	Human Factors
Armament	Safety/Environmental Health
Outfit	Survivability Systems
Major Equipment	
Survivability Systems	
Computers/IT	**Radars**
Architectural Compliance	Range
Speed of Calculation	Detection Limits
Memory Utilization	Jamming Protection
Throughput Capability	Reliability
Reliability	Error Rate/Signal Processing
Software Maintainability	Susceptibility
Security Controls	
Human Factors	

Table 3-2, Examples of Critical Technical Parameters

Section E. Key Performance Parameters

Key Performance Parameters (KPP) are those system capabilities or characteristics considered essential for successful mission accomplishment. The ORD should only contain a limited number of KPPs (approximately eight or fewer) that capture the parameters needed to reach the overall desired capabilities for the system. Failure to meet an ORD KPP threshold can be cause for the system selection to be reevaluated or the project to be reassessed or terminated. ORD KPPs should be presented in a tabular form; they are then extracted from the ORD and included in the performance section of the Acquisition Project Baseline (APB). If interoperability with other systems or agencies is an important factor in mission accomplishment, an interoperability KPP should be considered.

1. Selection Criteria

The following guidelines should be applied when selecting KPPs:

- Is it essential for defining system or required capabilities?
- Is it achievable and testable?
- Can the numbers/percentages be explained by analysis?
- If not met, are you willing to look at canceling the project?

2. ORD KPP Development

Selection of valid KPPs is more than just identifying a requirement and providing a threshold/objective value. A KPP should be a roll-up of a number of supporting requirements listed in the ORD. The following is a suggested method for developing KPPs:

- List system required capabilities for each mission/function as described above.
- Prioritize these requirements.
- For each mission/function build one measureable performance parameter.
- Determine the parameters that are most critical to the system and designate them as Key Performance Parameters in the ORD.

Section F. Trade-Offs

Provide a listing in priority order of requirements or critical technical parameters. Include cost factors such as acquisition cost or life cycle costs. These factors will be analyzed during the trade-off studies conducted to obtain a balanced system. This section will be refined as a result of the feasibility and cost studies conducted to support the Key Decisions.

Appendices

Provide information on studies or other analytical activities conducted thus far. Typically this would include the results of any feasibility studies or trade-off studies conducted to refine preliminary requirements in the PORD to firm requirements in the ORD. If lengthy, Executive Summaries of the studies are appropriate. For ORD revisions, provide information, which justifies all proposed revisions to requirements.

6. Deployment Planning

a. Purpose

This section sets the requirements and establishes policies and procedures for the conduct of deployment planning and the preparation, review and approval of a Deployment Plan (DP). These requirements apply to all major acquisitions.

b. Background

As a major acquisition project approaches the mid-System Development and Demonstration Phase, or the Low Rate Initial Production Phase (LRIP), when applicable, consideration must be given to deployment of the new assets to the users. Planning considerations include the timing of deliveries, the order in which new products will be delivered, homeport or site selection (including environmental impact analysis), and in many cases, the replacement and disposal of old assets with new ones. It is important for the Sponsor to begin planning for the deployment of new assets well in advance of their actual delivery. The deployment planning process is designed to turn over newly acquired or modified systems to users who are equipped by training or other performance intervention to operate and maintain the asset(s). Although it may seem a straightforward process, deployment planning is complex and can be costly if not properly implemented and managed. When properly planned and executed, deployment can make a major contribution toward the overall mission achievement if planned levels of readiness are met, planned costs are not exceeded, and logistics turmoil is minimized. This need is particularly critical for new vessels and aircraft where facilities may require upgrades or completely new construction. It is also important to plan for the deployment of new IRM hardware and software products where facilities may also have to be upgraded or modified (deployment of IT assets is often referred to as migration; i.e., the process may be known as Migration Planning).

c. Roles and Responsibilities

Sponsors should use existing project management team resources such as the Test Management Oversight Team (TMOT), Integrated Logistics Support Management Team (ILSMT), and Configuration Control Board (CCB) to address, develop, review and maintain deployment planning and execution. Deployment Planning roles and responsibilities include the following:

(1) Sponsor/Sponsor's Representative

The Sponsor/Sponsor's Representative is responsible for managing the Deployment Planning process. The Deployment Planning functions normally performed by the Sponsor's Representative on behalf of the Sponsor are shown in Table 3-3.

Sponsor's Representative Deployment Planning Functions
• Identifies potential deployment strategies for each deployment issue
• Determines costs of potential deployment strategies
• Determines homeports or sites where new assets are to be located
• Determines need for facility construction, upgrades, or modifications
• Determines priority order for deployment of new assets
• Determines disposal options for old assets
• Prepares Deployment Plan for Sponsor approval
• Updates Deployment Plan when required

Table 3-3, Sponsor's Representative Deployment Planning Functions

(2) Project Manager

The Project Manager (PM) is responsible for assisting the Sponsor in development of the Deployment Plan. Project Manager responsibilities are shown in Table 3-4.

Project Manager Deployment Planning Functions
• Provides delivery schedule to Sponsor to assist in planning
• Reviews and comments on Deployment Plan
• Reviews and comments on Deployment Plan Updates
• Endorses Deployment Plan and Updates

Table 3-4, Project Manager Deployment Planning Functions

(3) Project Management Matrix Personnel

Project management and matrix personnel shall work together to ensure that the deployment planning issues listed in Table 3-5 are addressed:

Project Matrix Deployment Planning Functions
• Identifies applicable project deployment strategies for each deployment issue
• Assesses alternative strategies to enable Sponsor's Representative to select optimum strategy
• Determines the cost of the management strategies for each deployment issue

Table 3-5, Project Matrix
Deployment Planning Functions

d. Procedures

The Deployment Plan (DP) is the basic planning document that addresses all areas of asset deployment related to the acquisition. The DP describes how applicable areas of deployment will be assessed and addressed.

(1) Preparation

The Sponsor's Representative is responsible for preparation of the DP.

- The Sponsor's Representative shall prepare the DP during the System Development and Demonstration Phase. An approved DP should be in place at KDP 3. If a project has a Low Rate Initial Production (LRIP) phase, as a minimum, a Preliminary DP addressing deployment of the LRIP quantity and the lead production article(s) should be in place to support the LRIP decision at KDP 2A.
- The DP shall be prepared in accordance with Exhibit 3-5.
- The Sponsor's Representative shall prepare the draft DP in consultation with all Program and Support Managers who are likely to participate in deployment efforts, to ensure that all appropriate deployment issues are addressed. Deployment considerations for vessel, aircraft, and electronics systems acquisitions are provided by the technical and organizational specialties represented on the project management matrix. Consensus should be achieved among the project matrix members through a Matrix-level concurrent clearance process.

(2) Review and Approval

A Matrix-level concurrent clearance review, consisting of the project matrix and all Program and Support Managers represented in deployment planning efforts, shall be conducted in accordance with the procedures in Chapter 6. If matrix-level review results in a non-concur response, receipt of substantive comments, or a significant change to the DP, a CGARC-level concurrent clearance may be required. After resolution of any matrix concerns, the Sponsor's Representative will provide the document package to the CGARC Executive Secretary (G-A-2) recommending whether the document should be routed for CGARC concurrent clearance. After resolution of matrix and/or CGARC concerns, and following the CGARC meeting, the DP is routed for approval. The DP is submitted by the Sponsor's Representative, endorsed by the Project Manager and Commandant (G-A), and approved by the Sponsor.

(3) Updates

The DP is an iterative document and will require regular updating. The DP should be reviewed at least annually, or as needed to reflect significant changes due to project dynamics. Change bars in the right margin should denote all changes to the DP. The approval process for DP Updates or revisions is identical to that cited in paragraph 3.6.d(2) above.

e. Documentation

Exhibit 3-5 presents sample Deployment Plan (DP) cover page, table of contents, and text content and format requirements. As a minimum, the DP should address all items listed in Exhibit 3-5.

Exhibit 3-5

SAMPLE DEPLOYMENT PLAN

Cover Page

Deployment Plan (DP)
for the

PROJECT TITLE

Submitted by:	Sponsor's Representative (G-XXX)	Date
Endorsed by:	Project Manager (G-AXX)	Date
Endorsed by:	Project Director (G-A)	Date
Approved by:	Project Sponsor (G-X)	Date

SAMPLE DEPLOYMENT PLAN

TABLE OF CONTENTS

Sample Deployment Plan

Content Requirements

Executive Summary

Provide an Executive Summary of the Deployment Plan. The Executive Summary should be a brief (one or two pages) discussion of the plan, highlighting the salient points of each section in the plan. Be sure to include the goals and objectives of the Plan and expected outcomes. Briefly discuss the roles and responsibilities of key participants and discuss reports expected to be prepared and how the reports will support project decisions.

Section A. Introduction

1. Project Summary

Briefly summarize the current status of the project. Include key events, which have already occurred, and a description of upcoming key events affecting deployment.

2. Background

Briefly describe any deployment planning activities, which have already occurred. Do not duplicate information that is addressed in other concurrent planning documents such as the Integrated Logistics Support Plan (ILSP).

Section B. Roles and Responsibilities

Identify all organizations that will be participating in the deployment planning program. Discuss in detail the roles and responsibilities of each of the identified organizations. Organizations that would normally be included in the deployment-planning functions include the Project Sponsor and Sponsor's Representative, the Project Manager, and operational units. Other organizations that could be included, depending on the nature and extent of the program, are the Support Program Managers (including those for System Safety, Human Factors Engineering, Logistics, and Support Facilities), the Engineering Logistics Center (ELC), the Operations Systems Center, (OSC), the Telecommunications and Information Systems Command (TISCOM), the Project Resident Office (PRO), and contractors.

Section C. Schedule

1. Deployment Schedule

For vessels and aircraft, provide a schedule showing the priority order in which assets will be delivered to the operational command and deployed. Be as specific with regard to dates and locations as possible.

2. Installation Schedule

For component systems (such as radars, electronic packages, Information Resource Management systems) provide a schedule showing the priority order of installation in the field. Be as specific with regard to dates and locations as possible.

Section D. Costs

Identify all costs, broken out by Fiscal Year, source, and type of funding (AC&I, OE) associated with deployment of the new assets to the field. Typical costs would include construction of buildings, piers, and hangars; dredging of channels and harbors; installation costs, including travel costs for installation teams; and recabling costs for computer installations.

Section E. Facilities

Identify all facilities that must be constructed, upgraded, or replaced in order for deployment to occur. Include piers, hangars, administrative/office buildings, storage and maintenance buildings, radio or radar towers, and associated utilities such as water, gas, and electrical connections required. For vessel projects, a Primary Crew Assembly Facility (PCAF) and one or more Maintenance Augmentation Teams (MAT) may be required.

Section F. Staffing Issues

Identify all additional staff positions required to accomplish deployment of the new assets. For example, a "Tiger Team" may be required to perform installations at the operating facility. Address all tasks that additional personnel are required to perform. Identify the number and rank/grade of personnel required and when they must be available.

Section G. Disposal

If new assets are replacing existing assets, address the method of disposal for old assets. For vessels that are being decommissioned, a decommissioning schedule should be provided.

Appendices

Attach copies of any reports or studies, which have been conducted in any of the above areas (Executive Summaries if lengthy). Such studies might include Facility Construction/Upgrade Analysis, Installation Cost Studies, etc.

Chapter 4

ACQUISITION MANAGEMENT PROCESSES

1. Background

Effective acquisition management involves the integration and coordination of many interrelated management activities and technical disciplines. The Project Manager is either directly responsible for or shares responsibility with others for the thoughtful, flexible and timely application of these activities and disciplines. This Chapter will describe processes, relationships, and documentation involved in acquisition management.

2. Discussion

The Coast Guard major acquisition organizational structure is based on the matrix concept, illustrated in Figure 4-1. Operating principles of a matrix organization are described below.

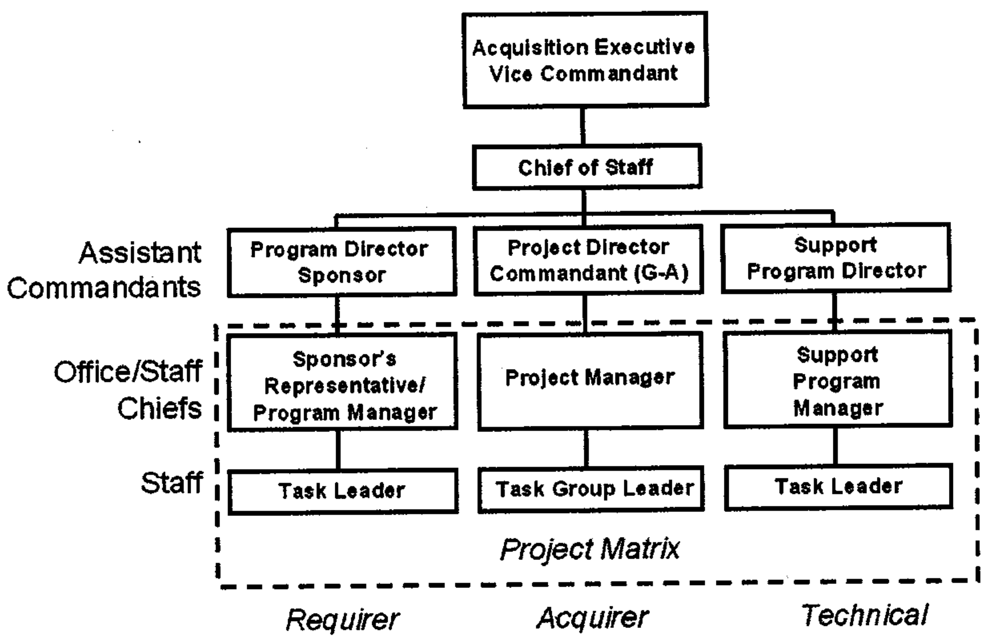

Figure 4-1, Acquisition Organizational Relationships

a. Matrix Management

The Project Manager (PM) is the focal point of the acquisition, bearing ultimate responsibility for meeting project objectives of cost, schedule, and performance. The PM organizes and leads the project matrix team, which consists of dedicated project staff and designated matrix members representing the cognizant program offices. The PM's staff is generally small in number and its efforts are focused on planning, execution and coordination of the project. The staff normally does not have the resources to perform tasks of a technical nature or that require specialized skills.

b. Matrix Resources

In a matrix organization, the PM does not have direct control of all of the resources needed to plan and execute the project. The PM obtains commitments for resources from functional managers for the performance of required activities. The key to effective project execution is in a negotiation process where the PM and Operating Program Manager (OPM) or Support Program Manager (SPM) have the flexibility to accommodate each other's conflicting requirements. The PM must negotiate with the OPMs and SPMs for use of their resources to accomplish project tasks.

c. Matrix Activities

Effective matrix activities are enhanced through efficient matrix meetings and attendance by matrix members who are empowered and prepared to speak for their respective organizations. Effective integration of effort by the PM and Task Group Leaders (TGLs) is needed to keep the matrix operating smoothly and to avoid conflicts which could result in delays in task completion. TGLs are usually project staff members, who coordinate and monitor the efforts of the Task Leaders (TL). TLs are designated matrix members, who provide the functional expertise necessary for the execution of project tasks. For example, an engineering TL may prepare or manage the preparation of a technical specification. The PM will coordinate among the TGLs to avoid schedule conflicts, which may arise when two or more TGLs require the services of the same Task Leaders at the same time. The PM will also coordinate among the TGLs when task priorities change and a shift in resources is required.

d. Matrix Priorities and Resource Utilization

Conflicts may arise when an OPM or SPM does not have sufficient resources to simultaneously satisfy the requirements of several Project Managers. If the affected PMs, OPMs, and SPMs cannot resolve the conflict, the Assistant Commandant for Acquisition will attempt to resolve the issue with the cognizant Operating or Support Program Director. If resolution is not possible, the Chief of Staff will set the priorities.

3. Roles and Responsibilities

a. Acquisition Directorate

The Assistant Commandant for Acquisition (Commandant (G-A)) serves the acquisition process in two roles. The first is as Project Director (PD), which is a project matrix organizational position. The Project Director is responsible for the major acquisition projects. The Project Manager reports directly to the PD, who reviews and evaluates the PM's performance and effectiveness in planning and executing the project, and organizing and directing the project matrix. G-A also provides acquisition management, contracting, and resource management in support of the project matrix team. The second role is as the Support Program Director for the Acquisition Support Program, which is a Headquarters organizational position. As the Acquisition Support Program Director, the Assistant Commandant for Acquisition is the Coast Guard's major acquisition agent. G-A is responsible for establishing and providing the processes, policies and procedures (including overall project management and oversight) for conducting major acquisitions. G-A is also directly responsible for delivering major new assets and platforms in accordance with AE approved cost/schedule/performance baselines, and is specifically responsible to the AE for managing risks by balancing these often competing interests. In executing their major acquisition responsibilities, G-A shall partner with all appropriate directorates from program inception to incorporate established policies, standards, guidelines, architecture, and best practices established and provided by the Coast Guard's functional agents.

b. Operating Program Offices

As the head of an Operating Program Office, the Operating Program Director (OPD) is responsible for several Coast Guard Operating Programs. The OPD who has the primary need for a major acquisition initiates the Project Nomination Proposal and is designated as the Project Sponsor by the Acquisition Executive (AE). Operating Program Managers (OPM) report to the OPD, who evaluates their participation in the project matrix organization and their performance in accomplishing project tasks. A single OPM will serve as the Sponsor's Representative in the acquisition process. The Sponsor's Representative is the PM's point of contact with the operating forces, and for operational requirements and issues. The OPM is responsible for defining operational requirements and critical issues for test and evaluation. The OPM is also responsible for Operational Test and Evaluation planning and execution, and Independent Operational Assessment and Independent Operational Test and Evaluation planning.

c. Support Program Offices

- As the head of a Support Program Office, the Support Program Director (SPD) is responsible for the efforts of a broad-based functional group and for several Support Programs. Support Program Managers (SPM) report to the SPD, who evaluates their performance in accomplishing project tasks. The SPMs are responsible for specific functional disciplines, such as electronic or naval engineering, logistics, training or system safety. The PM negotiates with the SPM for the specific functional resources required to accomplish each task. SPMs make commitments to provide the technical expertise and resources, and perform development tasks for acquisition projects such as design and integration engineering, specification development, or logistics support. The SPMs are the PM's point of contact with the field support activities.
- Each Coast Guard functional agent is responsible for establishing and providing policies, standards, guidelines, and best practices in their respective areas of expertise, to be applied in the acquisition and sustainment of Coast Guard assets and platforms. Where policies, standards, guidelines, and best practices do not exist, or innovation is desired, it is the responsibility of the respective agents and G-A to collaborate to develop innovative solutions and deliver supportable programs in accordance with the program baselines.
- As an example, the Assistant Commandant for Systems (G-S) is the Coast Guard's technical and logistics agent, responsible for establishing and providing policies, standards, guidelines, and best practices for overall engineering, maintenance, supply, transportation, C4I, and other elements of integrated logistics. Similarly, the Assistant Commandant for Human Resources (G-W) is the human performance, training, manpower, and safety agent; and the Director of Information and Technology (G-CIT) is the agent for information technology (IT) architecture and information management (IM) procedures and requirements; each is responsible for establishing and providing policies, standards, guidelines, and best practices in their respective functional areas.

d. Project Manager

By Chief of Staff charter, the PM has overall responsibility for the conduct of the major acquisition project. The charter establishes overall project objectives and details the PM's responsibilities, authority, and accountability for attaining project objectives.

(1) Responsibilities

The PM will:

- meet performance, schedule, and cost objectives;
- develop, maintain, and comply with all project related plans specified in Chapter 2;
- schedule project activities and monitor progress;

- meet all requirements of applicable directives and regulations in a timely manner;
- provide weekly progress reports to the Assistant Commandant for Acquisition;
- maintain the project financial plan and ensure a complete audit trail of project funds;
- submit or ensure submission of appropriate requests for resources (funds and personnel) needed to develop, acquire, and initially support the acquisition;
- maintain complete, up-to-date documentation of all actions and decisions;
- act as the principal source of information for internal and external inquiries and briefings on the project;
- ensure that the interests and requirements of all operating and support program managers are integrated into the project; and
- maintain a Lessons Learned file and prepare a Lessons Learned Report prior to relief as Project Manager.

(2) Authority

The PM is authorized to:

- take all proper actions necessary to attain performance, schedule, and cost objectives;
- obtain commitments from operating and support program managers to perform specific project tasks with their resources;
- act as the Approving Official with final approval authority over all project funds;
- act as the Approving Official with final approval authority over project budget forecasts, obligation plans, and financial documents;
- establish project status reporting requirements;
- act as the approval authority for the specifications for project related contracts and provides funding and technical assistance required for the contracting officer to execute necessary contract modifications; and
- obtain contractor support services to perform tasks outside the capability of Coast Guard resources.

(3) Accountability

The PM is accountable:

- to the AE through the Chief of Staff and the Assistant Commandant for Acquisition for project planning and execution;
- for maintaining a current Acquisition Plan (AP) and Acquisition Project Baseline (APB) as inputs for the Key Decision Point Reviews and to support budget requests; and
- for maintaining an audit trail of past actions and decisions which show evidence of compliance with established policy and procedures.

(4) Activities

The PM will:

- assist the Sponsor's Representative in defining the operational and support requirements for the system;
- formulate an Acquisition Plan, with Contracting Officer assistance;
- develop the project personnel needs, including matrix support, with G-A-1 assistance;
- establish and manage the project matrix organization, which includes:
  - defining matrix tasks, including: content, responsibility, resources, schedule, and deliverables;
  - negotiating with OPMs and SPMs for resources needed to accomplish project tasks;
  - managing and monitoring project task completion progress; and
  - ensuring that the interests and requirements of all operating and support program managers are integrated into the project;
- direct the activities necessary for selection of the concept which best meets operational requirements;
- direct Developmental Testing and Evaluation to ensure that the system is ready for System Development and Demonstration, and Production and Deployment;
- support the Sponsor in Operational Testing and Evaluation activities to demonstrate that the system is ready for production and/or deployment;
- ensure that the system logistics support resources are in place prior to the hand-off of the first unit; and
- ensure that each unit is ready for unrestricted operations at the hand-off to the operational commander.

e. Project Team Members

Team members are either dedicated or designated to the project staff. Dedicated members are the PM's full-time project staff members. The project staff assists the PM in planning and executing the project and coordinates the efforts of participating organizations. Designated matrix members bring specialized technical skills to the project on an "as required" basis from their operational or support program organizations. The project team, Figure 4-2, typically consists of the following:

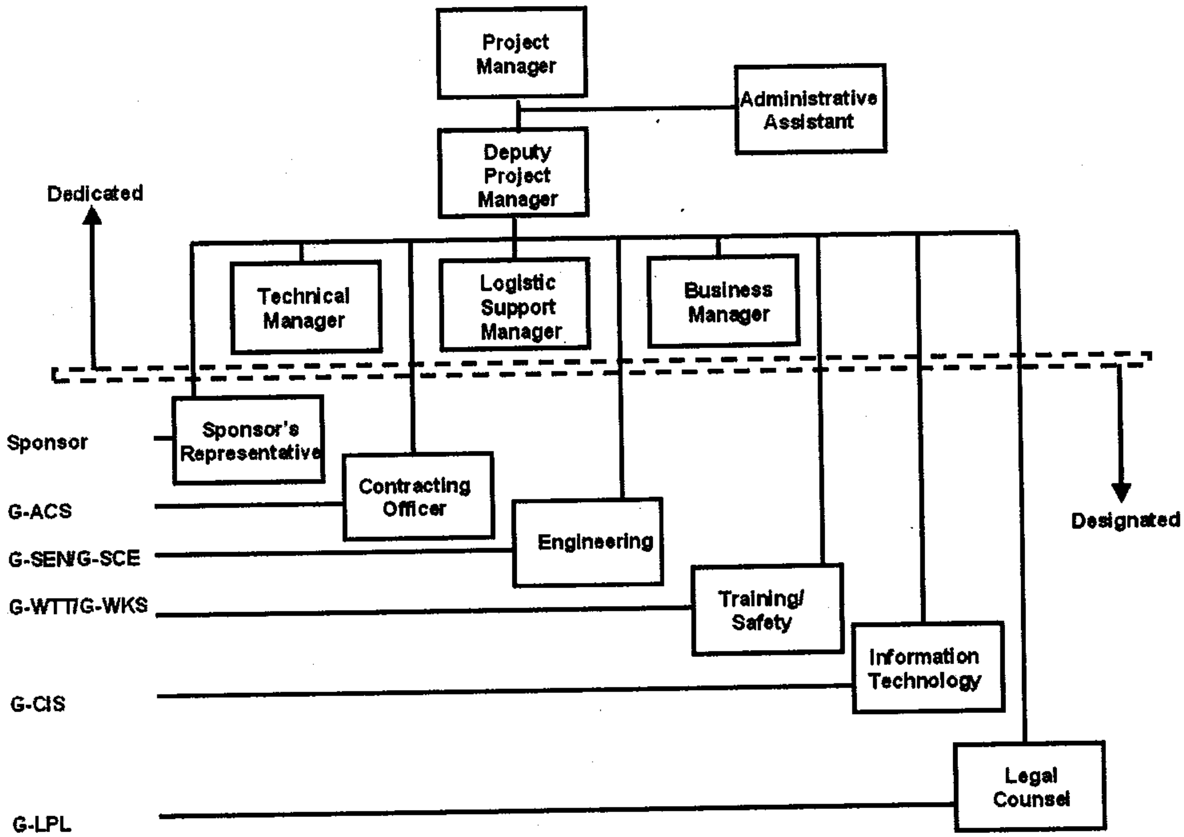

Figure 4-2, Typical Project Matrix Team

(1) Dedicated Staff Members

(a) Deputy Project Manager

Serves as the key member inside the project staff for the day-to-day planning, execution and coordination activities. Assists the PM in organizing and leading the project matrix team. Serves as acting Project Manager in the absence of the PM.

(b) Technical Manager

Analyzes technical issues to support decisions which must be made by the PM. May be required to provide technical reviews of deliverables to ensure all contract specifications are met within allowable tolerances. Reviews and recommends action on all contract deliverables, drawings, engineering change proposals, logistics and cost/price analysis. Assists in defining system requirements and in coordinating the planning and execution of system testing and evaluation. Works closely with technical personnel in supporting organizations to coordinate all technical and engineering issues.

(c) Logistic Support Manager

Identifies the system's support requirements and plans for their development and implementation. Ensures that logistics considerations are included in project cost estimates and project management planning. Often serves as the project's Configuration Manager.

(d) Business Manager

Develops and executes approved budgets, maintains and updates detailed reports including internal Coast Guard and external reports to OST, OMB and the Congress.

(2) Designated Matrix Members

(a) Sponsor's Representative

Develops mission need, establishes the operational requirements, and monitors the achievement of end-user's requirements, through the conduct of Operational Test and Evaluation (OT&E).

(b) Contracting Officer

Assists the PM in developing the acquisition strategy objectives, Acquisition Strategy Proposal, and Acquisition Plan, issues the contract solicitation, and awards and administers the contract(s).

(c) Legal Counsel

Advises the PM on legal matters, reviews documents for legal sufficiency, and represents the Coast Guard in protests and other legal proceedings. For legal matters pertaining to specific source evaluations, legal assistance shall be coordinated through the assigned Source Evaluation Board Chairperson.

(d) Others

As required, other members with specific specialties will be assigned to the project. Examples include engineering and logistics support (G-SEN, G-SEA, G-SEC, G-SCE, G-SLS, G-SLP), computer/network infrastructure (G-SCC, G-SCT) personnel, training, and safety support (G-WKS, G-WTT), information technology and management (G-CIS, G-CIM), research and development (R&D Center), and contractors.

a. Project Management Planning

(1) Purpose

This section describes project management planning and sets the requirements and establishes procedures for the preparation, review and approval of Project Management Plans (PMP).

(2) Background

Project management provides centralized authority and control over all technical, business, and risk management aspects of the project. Risk is inherent in all acquisition projects and must be controlled by project managers and all involved to ensure that project objectives are met. Thus, it is necessary that project managers, early in the acquisition process, develop a comprehensive risk management strategy within the PMP that complements the acquisition strategy and that will effectively establish and maintain risk at an acceptable level as the project evolves. To accomplish this, a Project Manager (PM) must perform the four basic functions of general management: planning, organizing, directing, and controlling.

(a) Planning Function

Planning is the process of establishing detailed project phase objectives and determining the sequence of development activities needed to attain those objectives. The planning process includes defining activities and tasks, time and cost targets, and technical parameters. Additional emphasis is required from the PM to focus on risk when planning for and conducting the project. Project-specific risks are initially identified and then formulated around the acquisition strategy to enhance the project's ability to develop or adjust the PMP as new sources of risks are encountered. This will result in the successful achievement of project objectives. During the planning process the PM will perform the activities shown below in Table 4-1.

Planning Activities
• Develop detailed objectives for the coming project phase
• Define activities, risks and tasks for each project functional area
• Develop a project schedule

Table 4-1, Planning Activities

(b) Organizing Function

The PM's support matrix organization must be clearly established to ensure personnel performing project tasks understand their responsibilities and the actions required to attain project objectives. In organizing, the PM will perform the activities shown in Table 4-2.

Organizing Activities
• Define project activities and tasks
• Consolidate resource requirements
• Obtain firm task commitments from heads of all matrix elements
• Finalize the project work breakdown structure, schedule networks, and task descriptions

Table 4-2, Organizing Activities

(c) Directing Function

The PM has the authority to direct performance of project tasks and is responsible for making critical decisions to solve cost, schedule, and technical issues. By having this authority, the PM can ensure an ongoing proactive and accountable exchange of risk information occurs between project personnel, internal and external stakeholders. In directing, the PM will perform the activities shown in Table 4-3.

Directing Activities
• Establish two-way communications
• Map risk management activities to specific project roles
• Involve project personnel in resolving issues
• Encourage innovation and active participation

Table 4-3, Directing Activities

(d) Controlling Function

Controlling consists of monitoring progress and taking corrective action as issues arise. This function allows the PM to take a conceptual view of project risks, issues and tasks to enable comprehensive project decision-making. As tasks are executed, the PM must track cost, schedule and performance achievements against the current, approved Acquisition Project Baseline (APB). In controlling, the PM will perform the activities shown in Table 4-4.

Controlling Activities
• Require and receive status reports
• Develop and direct changes to resolve issues
• Develop and direct staffing actions
• Manage risks routinely throughout all project phases
• Provide status reports to the Project Director

Table 4-4, Controlling Activities

(3) Discussion

- The Project Management Plan (PMP) provides the framework to define the activities/taskings, responsibilities, risk management techniques and the timing of events, and is the PM's blueprint for project management. It provides members of the matrix organization a clear understanding of what is required of them and when it is required, so they can work together with clarity of purpose. As part of project management planning, PMs must continually assess project risks. To assess and manage risk, PMs can use a variety of techniques, including technology demonstrations, prototyping, and test and evaluation. Risk management encompasses identification, mitigation, and continuous tracking and control procedures that feed back through the overall project assessment process to decision-makers. This translates into a comprehensive risk management strategy that complements the acquisition strategy and will effectively establish and maintain risk at an acceptable level as the project progresses. There is no one standard approach for risk management. The risk management approach must be tailored to the specific project, taking into account project management constraints and the acquisition strategy. The PMP is considered the primary project-planning document; planning in technical functional areas, shown in Figure 4-3, must flow from and be consistent with the PMP.

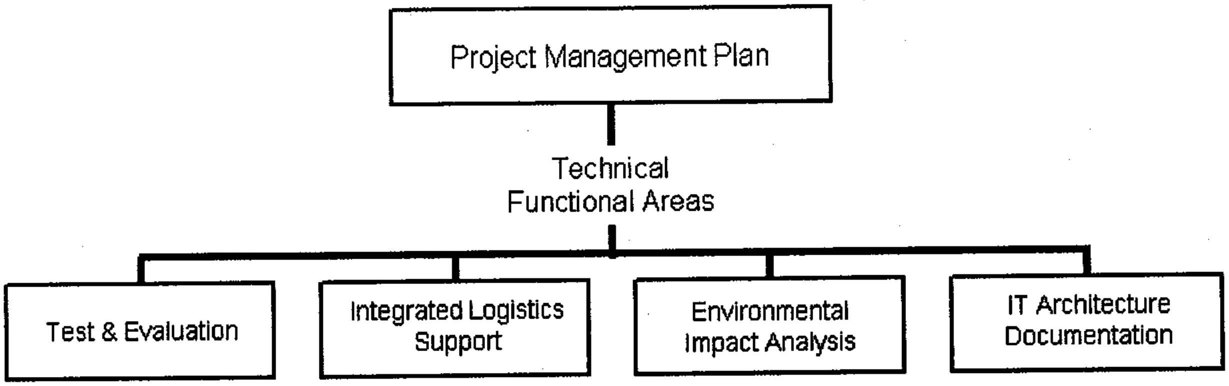

Figure 4-3, Acquisition Planning Relationships

- The PM must continuously plan and organize project activities beyond the current acquisition phase. As the project progresses through the various phases, the PMP will require revisions to continually update it for the upcoming phase. The PMP is dynamic and must be maintained as a "rolling plan" in which the next phase is planned in detail and succeeding phases are planned in less detail, but with sufficient information to permit the development of credible schedules and resource estimates. Focusing on the next phase requires that all tasks for that phase be identified and documented.

- The recommended means of documenting planned tasks and the Support or Operating Program Manager's commitment for task execution is the Task Commitment Memorandum (TCM). The Task Commitment Memorandum form is available in the Jetform Filler form library (h:\cgforms\forms\g-a\taskcmtm.mdf). The PMP should include a summary of TCMs for the coming phase and identify what tasks are planned for subsequent phases. Each edition of the PMP will record task commitments, task completion schedules, project resource requirements, and resource plans. At each KDP, the CGARC will review the project's progress and achieved results, as well as future plans, before granting approval to enter into the next project phase.

- Enclosure (1) Project Management Tools, provides guidance on effective project management tools. Subjects that are addressed include Work Breakdown Structures (WBS), Schedules and Scheduling Techniques, Cost Estimating and Analysis Techniques, Risk Management Techniques, Human Systems Engineering/Human Systems Interface (HSE/HSI) and Systems Engineering (SE) Management Techniques.

(4) Roles and Responsibilities

The PM is responsible for the conduct of the major acquisition, associated acquisition management, coordination of all project tasks, and preparation of the PMP. Specific PM responsibilities, as levied by Chief of Staff charter, and general matrix responsibilities are described in paragraph 4.4.3.d.

(5) Procedures

(a) Preparation

- The PM shall prepare an initial PMP, in accordance with Exhibit 4-1, as early in the project as possible, but it must be submitted for approval within six months of the approval date of KDP1. Exhibit 4-1 presents a sample PMP Cover Page and Table of Contents, and PMP content and format requirements.
- The PM should prepare the draft PMP in consultation with all Program and Support Managers involved in the project to ensure all appropriate tasks are addressed and assigned.

(b) Review and Approval

A Matrix-level concurrent clearance review of the PMP shall be conducted (be sure to include G-CPA and G-A-1), in accordance with the procedures in Chapter 6. After resolution of matrix concerns, the PMP is submitted for approval. However, if matrix-level review results in a non-concur response, receipt of substantive comments, or a significant change to the PMP, a CGARC-Level Concurrent Clearance may be required. The PM will provide the document package to the CGARC Executive Secretary recommending whether the document should be routed for CGARC concurrent clearance. Following all required clearances, the PMP is submitted by the PM, endorsed by Commandant (G-A), and approved by the Chief of Staff, Commandant (G-CCS).

(c) Updates

The PMP is a dynamic document and will require regular updating. As a minimum, the PMP shall be reviewed and updated as required at each subsequent KDP, and may be provided as a supporting document to the respective decision documents forwarded to the AE. In addition, the PMP shall be updated if significant changes in project execution plans, schedule, or resource requirements occur. All changes to the PMP should be denoted by change bars in the right margin. The review and approval process for PMP Updates shall be in accordance with paragraph 4.4.a(5)(b) above.

SAMPLE PROJECT MANAGEMENT PLAN

Cover Page

Project Management Plan (PMP)

for the

PROJECT TITLE

Submitted by:	Project Manager (G-AXX)	Date
Endorsed by:	Project Director (G-A)	Date
Approved by:	Chief of Staff (G-CCS)	Date

SAMPLE PROJECT MANAGEMENT PLAN

TABLE OF CONTENTS

Enclosures

1. **Task Description Executive Summary**
2. **Project Master Schedule**
3. **Risk Watch List**
4. **Organization Charts**
   - **(a) Project Staff**
   - **(b) Project Matrix**
   - **(c) Project Resident Office/Contract Administration**

Sample Project Management Plan

Content Requirements

1. General

The PMP should be a user-friendly document which does not repeat policy, information or boilerplate from other sources. It should focus on the approved strategy and what has to be done by whom and when. Since each acquisition is unique, the exact content will vary. The content of the PMP shall include:

2. Contents

Executive Summary

Provide an Executive Summary of the Project Management Plan. The Executive Summary should be a brief (one or two pages) discussion of the Plan, highlighting the salient points of each section in the Plan. Be sure to include the goals and objectives of the Plan and expected outcomes. Briefly discuss the roles and responsibilities of key participants and discuss reports expected to be prepared and how the reports will support project decisions

Section A. Introduction

1. Scope

This section should describe the plans and objectives of the project and how the PMP will be used to accomplish these objectives.

2. Current Status

This section should briefly discuss the **key activities of the project to date**, with bullet highlights and references. This includes focusing on where the project is within the acquisition process (e.g., what was the last KDP and when is the next KDP). The status of the Acquisition Project Baseline (APB) should also be discussed in this section.

Section B. Project Planning

1. Key Events

The focus should be the key actions of the **upcoming phase (future) required to complete the acquisition strategy** and the specific objectives and milestones to be met to deliver the system required by the sponsor.

The schedule for executing major project tasks should be highlighted; a brief description of each Key Event should be provided. A complete listing of completed, in-process and planned tasks should be included in the Task Description Executive Summary enclosure. When contractor support is employed, the progress and completion of the tasks should be documented in the Key Events and Project Master Schedule portion of the PMP.

2. Resource Planning

This section should describe the current personnel assigned to the project staff or funded by the project and assigned to other staffs, and financial resources of the project. A description of the resources required to execute the next acquisition phase and those planned to complete the project should be included in this section. Provide charts that show personnel and financial resources broken out by Fiscal Year, including prior years. Work closely with G-A-1 staff to coordinate this information.

Section C. Risk Management Planning

1. Purpose

This section of the PMP should address the purpose and objective of risk management and include the approach being used to manage project risks, and the acquisition strategy. The acquisition strategy should address its linkage to the risk management strategy.

2. Risk Management Strategy and Approach

Provide an overview of the risk management strategy and approach, to include the status of the risk management effort to date, and a brief description of the project risk management strategy. Describe the project risk management process to be employed; i.e., risk planning, identification/assessment, handling, monitoring and documentation, and a brief explanation of each of these components. This section of the chapter must describe the process used to identify and analyze the risk associated with the project. Address how test and evaluation techniques will be used to determine system maturity and how it will be used to identify areas of technical and operational risk.

3. Risk Organization (if applicable)

Describe the risk management organization of the project (if applicable) and discuss in detail the roles and responsibilities for each of the risk management participants. Participants that must be included in the risk management organization include the Project Manager, the Project Sponsor, the Independent Operational Test and Evaluation Advisor (IOTEA), if required, and contractors. Other organizations which could be included, depending on the nature of the project, are the Support Program Managers, the Coast Guard R&D Center, the Operations Systems Center, the Project Resident Office (PRO) or organizations responsible for contract administration and operational units.

4. Risk Quantification

Describe the risk quantification methods used to evaluate risks and the risk interactions to assess the range of possible project outcomes. This analysis is an evaluation of the identified risk events to aid in the determination of likelihood and consequences of the assessment.

5. Risk Response Development/Control

Briefly describe each identified risk in terms of feasibility, expected effectiveness, cost and schedule implications, and the effect on technical performance. This includes a description of the process used to monitor and document (i.e., watch list) risks. The key to risk response control is to establish some type of indicator system over the project. The project manager uses this system and all those involved help evaluate the status of the project. It should be designed to provide early warning when problems arise, so management actions to mitigate the risks to those problems can be taken.

Section D. Project Management Structure

1. Organization

Describe the organizational relationships, lines of authority, and matrix elements. The responsibility and authority of each organizational element with respect to the project should be stated. The plan for building up and/or scaling back the project staff and Project Resident Office (including contract administration if no PRO is anticipated) should also be discussed. A project organizational chart should be provided as an enclosure to the PMP.

2. Required Reports

(a) Internal Reports

Establish and describe the reports that will be required of the matrix elements and provided to the PM. These reports should update and report the status and completion of project tasks, and should identify problems within the project.

(b) External Reports

Establish and describe the reports that will be required of the PM. External reports will include those provided to Commandant (G-C), Commandant (G-CCS), Commandant (G-A), Office of the Secretary of

Transportation (OST) and interested Congressional staffs. These reports should update and report the status and completion of project tasks, and should identify problems with the project. Reports external to the Coast Guard must be cleared through Commandant (G-CCS) and/or Commandant (G-CRC).

Section E. Detailed Planning Documents

Specific plans to execute technical activities of the project are developed in detailed planning documents, and include the Test and Evaluation Master Plan (TEMP), Integrated Logistics Support Plan (ILSP), Environmental Impact Analysis (EIA) Documentation, and Enterprise IT Architecture Application Systems Perspective Documentation. These plans are not a part of the PMP. The PM is responsible for developing them separately after the approval of the PMP. The PMP does, however, describe the basic objectives of these documents and how they relate overall to the planned project activities. For each of the detailed planning documents listed below, describe the project goals and objectives for their respective functional areas, their management structure, and their development schedule. Chapter 2 of this Manual lists the required documentation for each phase of the acquisition process.

- Test and Evaluation Master Plan
- Integrated Logistics Support Plan
- Environmental Impact Analysis Documentation
- Enterprise IT Architecture Application System Perspective Documentation

Enclosures

The following documents should be attached as enclosures to the PMP.

1. Task Description Executive Summary

This section is an executive summary of the project's Task Commitment Memoranda. The summary should include a brief description of the specific tasks, the responsibility assignments, and the current status of the tasks, e.g., planned, in-process, or completed. Recommendation: Many project staffs have found it convenient to present the Task Description Executive Summary as a Gantt Chart displaying the task, responsible organization, and planned and actual activity dates.

2. Project Master Schedule

This is the detailed schedule of the entire project. Typically the Master Schedule is depicted as a chronological listing of tasks/events and their respective dates; actual and planned dates are distinguished. To add stability to the Master Schedule and to avoid the use of "point" dates, use of the dating scheme shown in Table 4-5 is recommended.

Date Formats for Acquisition Documents	
Event To Occur	**Dating Convention**
• Within 1 Year	• Use Month and Year, e.g., 03/01
• Within 1 to 3 Years	• Use Quarter and Fiscal Year, e.g., 1st Qtr FY02
• Beyond 3 Years	• Use Fiscal Year, e.g., FY05

Table 4-5, Date Formats for Acquisition Documents

3. Risk Watch List

Identify and list critical areas which top management should pay special attention to during the current and upcoming phases/segments of the project. The watch list is developed based on the results of the risk assessment. The watch list items can be added or removed as the project progresses with periodic assessments being conducted during formal/informal meetings. This list can range in complexity from a simple list of the identified risks to ones that include such items as the priority of the risk, how long it has been on the watch list, the handling actions, planned and actual completion dates for handling actions and explanations for any differences or discrepancies. The format taken must be tailored to the project taking into account focus and impact of each risk item listed for the upcoming phase or segment. The table below (Table 4-6) provides an example of risk items that may be included in a risk watch list that warrant higher-level management attention.

Exhibit 4-1 (cont.)

Project Watch List Examples				
ID #	Risk Item Description	Mitigation Goal/ Success Measures:	Area(s) of Impact	Status/ Explanation
##	System Integration Issues	Define, document viable procedure to address each issue	System Development & Demonstration; Production & Deployment	• Additional funding necessary for system integration • Schedule informational briefing for stakeholder discussions
##	Operational Testing	Develop test scenarios with conditional information	LRIP Testing	• Poor weather conditions for testing; possible schedule slippage
##	Incomplete Logistics Support Analysis	Ensure training provided to end-users/reduce help desk-calls	ILS Planning and Support	• Acquire additional training tools for users

Table 4-6, Project Watch List Examples

4. Organization Charts

(a) Project Staff

(b) Project Matrix

(c) Project Resident Office/Contract Administration

b. Acquisition Strategy Planning

(1) Purpose

This section describes acquisition strategy planning and establishes the requirements and procedures for the preparation, review and approval of the Acquisition Strategy Proposal (ASP) and the Acquisition Plan (AP).

(2) Background

Contracting is an indispensable activity in the process of providing goods and services for the Coast Guard. Contracting professionals have a large number of regulations, policies, guidance and resources to follow/use in the performance of their duties. Accordingly, this section provides procedures for developing the acquisition strategy and planning the necessary contracting actions for a major acquisition, and highlights the activities and responsibilities of the PM and technical representatives with respect to contracting.

(3) Discussion

The acquisition strategy establishes the framework within which detailed acquisition planning and project execution are accomplished. It is a description of how the project will acquire a major system, i.e., "how we will buy it," and once approved, should reflect the Acquisition Executive's decisions on all major aspects of the acquisition. Sound acquisition strategies describe the relationship of the essential elements of the project — management, technical, resources, testing, training, deployment, support, safety, and contracting.

(a) Acquisition Strategy Objectives

- Minimize the time and cost of satisfying the approved mission need, consistent with common sense and sound business practices. The strategy must be tailored to match the character of the project and allow the most efficient satisfaction of project requirements, consistent with the degree of risk involved.

- Establish the managerial approach that will be used to direct and control all elements of the acquisition to achieve project objectives.

- Apply all the right expertise to formulate the acquisition strategy. The Project Manager must develop the strategy in coordination with the project matrix team. Of particular importance to the process are those organizations that "own" topics addressed in the acquisition strategy (e.g., support program managers and facilities managers).

(b) Acquisition Strategy Guiding Principles

Fundamental principles apply to the development of all acquisition strategies.

1. Understand Project Objectives and Operational Requirements

As the starting point, the priorities and needs of the project must be understood to develop a sound acquisition strategy. For example, if the objective is to develop a replacement system that will reduce the cost of accomplishing an existing mission, the acquisition strategy will be different than if the objective is to develop a replacement system that must be 50 percent more capable than the existing system. Similarly, if requirements dictate that the system interoperate with 10 other systems, five of which are also being developed, the acquisition strategy will differ from that for a system which must only interoperate with two other well-established systems.

2. Relate the Strategy to Acquisition Phases and Key Decision Points

The scope, intended products, critical events, and exit criteria for each phase must be known to help make decisions as to: how much development concurrency makes sense; how long to maintain competition; how to structure contracts; or what prerequisites to establish for the exercise of options. These items should be reflected in the Key Events and Project Master Schedule portion of the PMP.

3. Structure the Project to Foster and Accommodate Cost/Performance Tradeoffs

Every project must strike its own balance between achieving needed performance and keeping costs down. We rely on system integrator/development contractors to make the many specific tradeoffs necessary to design and develop the system. They will make these tradeoffs within the integrated framework you establish for them, consisting of the space defined by the distance between performance objectives and thresholds; the project's cost objectives; and the associated aspects of the acquisition strategy, such as contract type and incentive arrangements.

4. Keep an Event-driven versus Schedule-driven Orientation

Events rarely unfold as predicted in the schedules developed at the beginning of a project, or even at the beginning of an acquisition phase. Complex systems acquisitions span several years, several budget cycles, and more than one presidential term, all of which can affect funding and schedules. Thus, every acquisition strategy must be event-driven, explicitly linking project decisions to demonstrated accomplishments in development, testing, initial production, and life-cycle support. For example, the prerequisite for a key decision is accomplishment of exit criteria, and not the passage of time. Another example is that the exercise of a contract option should be tied to accomplishment of events rather than to firm dates.

5. Harness Competitive Forces

For industry, competition to win business, along with attendant business profit, is by far the most powerful incentive. Therefore, the PM shall maintain competition as long as practicable in all acquisition projects.

- Competitive strategies such as "design-offs", competitive prototyping, and competition with other systems have the potential to enhance system performance, improve schedule, reduce project cost, and reduce project risk and must be built into the acquisition strategy during development.
- Project Managers and contracting officers must provide for full and open competition, unless one of the limited statutory exceptions applies. They must ensure that solicitations and contracts are written without unnecessarily: restrictive statements of need, detailed specifications, and burdensome contract clauses. They must also ensure that procurement and source selection procedures do not work to exclude or discourage potential offerors from submitting proposals. Project Managers must provide for long-term access to data required for competitive sourcing of systems support.

6. Make Business Approach Consistent with Project Risks

The project's business arrangements, including contract types and incentives, must be appropriate for project risks. Competition is the most reliable tool for driving risk out of a project and achieving performance targets within a reasonable timeframe. If risks are significant at the outset, and must be driven down by the next decision point, maintaining competition until that decision point is probably in the best interest of the project. Additionally, contracts are not merely vehicles for obligating funds and taking delivery of products; they should be effective management tools throughout the period of performance. They should be structured to motivate contractors to manage the work effectively while satisfying all contract requirements, *and* to provide the PM with enough insight to identify performance problems early and enough influence to motivate the contractor to take needed corrective actions. The contract's basic pricing arrangement (or contract type) and its incentive structure are the primary means of providing the PM influence during the period of performance. **Note: Contracts only work as intended if they fit the real risk picture - the circumstances in which the contractor will perform.**

(4) Roles and Responsibilities

(a) Project Manager

The Project Manager (PM) is responsible for developing the acquisition strategy and planning the necessary contracting actions for the project.

(b) Contracting Officer

The Contracting Officer's (KO's) specialized responsibilities are dictated by Federal Statutes and Regulations. The KO takes a leadership role exercising authority established through the FAR, TAR, TAM and CGAP.

As a member of the matrix team, the KO contributes to the overall effort by leading the activities involved in developing the acquisition strategy. Through the PM, the KO requests the support of other matrix team members to accomplish the activities involved in planning, soliciting, awarding, administering, and closing out a contract.

Commandant (G-ACS) designates one or more KO(s) for each major acquisition. Contracting Officer key functions are shown in Table 4-7. The KO has sole authority to enter into, administer, or terminate contracts; make related determinations and findings; and is the only member of the matrix team with authority to commit the Government through contractual agreements. The KO ensures that structured source selection procedures are followed and the integrity of proprietary and source selection information is maintained throughout the procurement process.

Contracting Officer Key Functions
• Teaming with Project Manager in development of Acquisition Strategy Proposal, Acquisition Plans, solicitations and assuring the development of all supporting documentation
• Initiating and managing the source selection process
• Conducting contract negotiations
• Formulating, awarding, administering and closing out contracts
• Providing guidance for Administrative Contracting Officers (ACOs)

Table 4-7, Contracting Officer Key Functions

(c) Contracting Officer's Technical Representative

While the Contracting Officer (KO) has total responsibility for the administration of Government contracts, certain duties of the KO may be delegated to qualified individuals. Prime among these are duties requiring technical expertise and/or on-site activity at the contractor's facility. Contract Administration functions such as in-process inspection, technical review of documentation, review of progress for progress payment purposes and preliminary acceptance of deliverables are usually delegated to the Contracting Officer's Technical Representative (COTR).

- Contract administration responsibilities are specifically delegated in a letter issued by the KO to the COTR. COTRs should bear in mind the limits of their authority, which never includes the authority to make changes to the contract.
- When working with the contractor, the COTR represents the KO, not his/her technical or project office. The technical office is represented through the KO by requesting action under the contract provisions such as the "Changes" clause.

(5) Procedures

The PM and KO, with assistance from the Project Matrix Team, prepare the Acquisition Strategy Proposal (ASP) and subsequently the Acquisition Plan (AP), described in Exhibits 4-2 and 4-3 respectively. The ASP and the AP refine the acquisition strategy objectives of the approved MNS; update and expand on the information at each KDP; and describe the Project's plan for competition, source selection, and other contracting considerations. These documents lead to the development of the Selection Plan (SP), Proposal Evaluation Procedures (PEP), and Request for Proposal (RFP).

ACQUISITION STRATEGY PROPOSAL

1. General

The Acquisition Strategy Proposal (ASP) provides brief planning information and the acquisition strategy for acquisitions going into the Concept & Technology Development Phase.

2. Discussion

The ASP serves as the Acquisition Plan for the Concept & Technology Development phase and must be approved prior to the release of a synopsis under FAR 5.2; issuance of a solicitation; or transfer of funds within or outside DOT, for Concept & Technology Development phase activities unless otherwise authorized by the Vice Commandant.

The ASP shall be submitted within six months of KDP 1 approval. An ASP will not be required if an Acquisition Plan (see Exhibit 4-3) is submitted for approval within six months of KDP 1.

3. Format and Contents

The format for the ASP shall be a simple narrative and shall include the following:

- The proposed acquisition strategy for the Concept & Technology Development phase including proposed milestones.
- The concepts/alternatives to be explored (provide only a listing; do not repeat the descriptive material in the MNS).
- The cost estimate for the Concept & Technology Development phase (including: funds, personnel, cost ceiling, and source for resources).
- A recommendation on whether discretionary KDP 1A should be conducted within the Concept & Technology Development phase.
- A recommendation on whether IOT&E should be conducted.
- The proposed exit criteria for activities that must be accomplished prior to advancing to the next acquisition phase or phase segment.

4. Preparation

The designated KO will prepare the ASP for the PM with the assistance of the project matrix team, including Commandant (G-A-2). The PM shall circulate the ASP for review by the primary project matrix members, i.e., Sponsor's Representative, G-A-2, G-ACS, G-CPA, G-CPM and G-LPL. Upon resolution of comments from within the matrix, the PM will submit the ASP to the CGARC Executive Secretary for release for CGARC concurrent clearance in accordance with Chapter 6. The Coast Guard Competition Advocate, through the CGARC review, shall review all major acquisition ASPs.

5. Approval

The Acquisition Strategy Proposal shall be submitted by the KO, via the PM and CGARC Executive Secretary; endorsed by Commandant (G-A); and approved by Commandant (G-CV).

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ACQUISITION PLAN

1. General

The Acquisition Plan is a formal, decision document. The AP is based on and refines the acquisition strategy objectives of the approved MNS; updates and expands on the information provided in the Acquisition Strategy Proposal (ASP); and describes the project's plans for primary and support procurements, inter-agency agreements, competition, and source selection.

2. Background

APs are required for all major acquisitions by the Federal Acquisition Regulation (FAR), Part 7. The AP is prepared by the project's designated Contracting Officer (KO) for the PM.

A streamlined approach is used for all major acquisitions. Each AP identifies the areas of streamlining appropriate to the acquisition. Streamlining techniques include, but are not limited to the following: sending out draft specifications, SOWs, and RFPs to industry for comment; limiting the size of proposals and the number of people on evaluation teams; and using performance based specifications. All streamlining efforts are aimed at ensuring that procurements are awarded in an efficient and expeditious manner.

3. Discussion

Preparation of the AP begins in the Concept & Technology Development Phase; submission of the AP is normally required at KDP 2. If a discretionary KDP 1A is required, the AP will be prepared for the KDP 1A review. The AP must be approved prior to the release of any System Development & Demonstration phase synopsis under FAR 5.2; issuance of a solicitation (draft or otherwise); transfer of funds within or outside DOT; or any other such action unless otherwise authorized by the Vice Commandant. However, preliminary acquisition efforts (e.g., defining requirements; issuing market search synopses and draft specifications or statements of work; preparing, but not releasing, draft solicitations) may be performed before acquisition planning is completed.

APs shall be reviewed at least once every twelve months. APs shall be updated:

- when a significant change to the approved AP is contemplated, e.g., a new requirement, change in existing requirements, and/or change in acquisition strategy including contract type, cost growth, etc.; and
- at each KDP.

4. Procedures

a. Preparation

The following procedures apply to both APs and AP updates.

- The PM is responsible for preparing the AP, in accordance with the following section, by KDP 2 or KDP 1A, if required.
- The designated KO will prepare the AP for the PM and with the assistance of the project matrix team, including Commandant (G-A-2).

b. Review and Approval

- The PM shall circulate the AP for Matrix-level concurrent clearance review, in accordance with Chapter 6, by the primary project matrix members, i.e., Sponsor's Representative, G-A-2, G-ACS, G-CPA, G-CPM and G-LPL.
- Upon resolution of comments from within the matrix, the PM will submit the AP to the CGARC Executive Secretary for release for CGARC concurrent clearance in accordance with Chapter 6 (see also the G-A-2 Intranet site for assistance with preparing packages for review and approval). The Coast Guard Competition Advocate, through the CGARC review, shall review all major acquisition APs.
- Since the AP is a significant planning document, the PM will prepare a briefing of the AP for presentation to the CGARC after CGARC concurrent clearance. The briefing should be prepared as prescribed in Chapter 6.
- Following the CGARC review, the AP is submitted by the KO, via the PM and CGARC Executive Secretary; endorsed by Commandant (G-A); and approved by Commandant (G-CV).

c. Updates

- As a minimum, the AP shall be reviewed annually and updated at each KDP subsequent to KDP 2. In addition, the AP shall be updated if significant changes occur in project execution plans, schedule, or resource requirements.
- When updates to the initial AP are provided, the revision number and date (e.g., Revision 1, 01 Jan 02) shall be indicated. When a change page is provided, an indicator bar shall be placed on the side of the page to identify the change.
- The review and approval process for AP updates shall be in accordance with section above.

d. Certification

During the AP annual review, it may be determined that the current AP requires no change.

- The PM shall certify, by memorandum via the CGARC Executive Secretary, to Commandant (G-A) that the information contained in the AP is accurate and complete and that no change is required.
- Commandant (G-A) will endorse the certification memorandum and return the original document to the PM for retention in the project AP file.

5. Content Requirements

This section presents a sample AP Cover Page, Table of Contents, and the AP content and format requirements.

Sample Acquisition Plan

Cover Page

Acquisition Plan (AP)
for the

PROJECT TITLE

Prepared by:	____________________ Contracting Officer	____________ Date
Submitted by:	____________________ Project Manager	____________ Date
Endorsed by:	____________________ Project Director Commandant (G-A)	____________ Date
Approved by:	____________________ Acquisition Executive Commandant (G-CV)	____________ Date

Sample Acquisition Plan

Table of Contents

Acquisition Plan

Content Requirements

1. General

Acquisition Plan (AP) contents may vary depending on the nature, scope, and complexity of the acquisition. Federal Acquisition Regulation (FAR) Subpart 7.105 provides specific guidance on topics the acquisition planner must consider when preparing the plan. Subparts 7.106 and 7.107 provide additional requirements for major systems and acquisitions involving bundling. The FAR can be viewed on line at http://www.arnet.gov/far/.

2. Contents

Section A. Acquisition Background and Objectives

1. Statement of Need

Provide a brief summary of the mission need as presented in the approved Mission Needs and summarize the relevant history of the acquisition.

2. Applicable conditions

Outline the significant conditions affecting the acquisition; provide information on requirements for compatibility with existing or future systems or programs, and any known cost, schedule and capability or performance constraints.

Section B. Technical Issues

1. Capability or Performance

Specify the required capability or performance characteristics from the Mission Needs Statement and/or Operational Requirements Document (ORD). Indicate how they are related to the need. Briefly summarize the key points and the status of the ORD.

2. Delivery or Performance-Period Requirements

- Establish the delivery or performance-period requirements and state the rationale. If urgency results in concurrency of development and production or other than full and open competition, this must be explained and supported.

- When applicable and in preparation for KDP 2, describe the plans for Low Rate Initial Production (LRIP), the proposed LRIP quantity, and the rationale for the quantity recommended.

3. Product Description

Explain the choice of product description types to be used in the acquisition. Specifications and purchase descriptions shall be specified in a manner designed to promote full and open competition.

4. Test and Evaluation

Describe the test program for each phase of the project. Briefly summarize the key points and the status of the Test and Evaluation Master Plan (TEMP). Address contractor and Government roles during testing. If concurrency is planned, discuss the extent of testing to be accomplished before Key Decision Point 3 (authorization to proceed to the Production and Deployment Phase).

5. Logistics Considerations

Briefly summarize the key points and the status of the Integrated Logistics Support Plan (ILSP). The following areas of logistics should be discussed:

- Assumptions used to determine contractor or in-house support, both initially and over the life of the system. Include contractor vs. in-house maintenance, servicing of the system, and contractor or Coast Guard maintenance, servicing, or distribution of commercial items.
- Reliability, Availability, and Maintainability requirements, including planned use of warranties.
- Requirements for contractor data (including repurchase/reprocurement data) and data rights, their estimated cost, and the planned use of the data.
- Standardization requirements and plans, including the necessity to designate, equipment as "standard" so the future purchases of the equipment can be made from the same manufacturing source.
- Manpower, Personnel, Training impact.

Section C. Business and Management Issues

1. Cost, Budgeting and Funding

Establish project cost goals, with supporting rationale and assumptions. Include a discussion of Life-Cycle Cost, Design-to-Cost objectives, and application of Should-Cost analysis. See FAR 7.105 for more detail on the requirements for this section. Provide a funding stream table for the project budget estimate. Explain how the estimates were derived, and discuss the impact of the schedule for obtaining adequate funds.

2. Trade-offs and Risks

Discuss the priorities and expected consequences of trade-offs among the cost, capability or performance, and schedule goals. Briefly summarize the salient risk management parameters of cost, schedule, and performance. If concurrency of development and production is planned, discuss its effects on cost and schedule risks.

3. Acquisition Streamlining, Competition, Sources, Contracting Considerations, and Source Selection Procedures

- Discuss the plans to encourage industry participation by using draft solicitations, presolicitation conferences, and other means of stimulating industry involvement during design and development in recommending the most appropriate application and tailoring of contract requirements. For each contract planned, discuss contract type, use of multi-year contracting, options, or other special contracting methods, etc.
- Describe how competition will be sought, promoted, and sustained throughout the acquisition process. This should include spares and repair parts. Discuss component breakout plans relative to major system components and subsystems. Identify key logistics milestones that effect competition. If full and open competition is not planned, cite the authority in Federal Acquisition Regulation Subpart 6.302 that is the basis for limiting competition.
- Indicate the prospective sources of supplies and/or services that can meet the need. Include consideration of small business, small disadvantaged business, and women-owned small business concerns.
- Discuss procedures, including the timing for submission and evaluation of proposals, and the relationship of evaluation factors to meeting project objectives.

4. Contractor vs. Government Performance and Inherently Governmental Functions

Address consideration given to Office of Management and Budget Circular A-76 and OFPP Policy Letter 92-1 (see FAR Subpart 7.3) for all or part of system and its logistic support.

5. Contract Administration and Management Information Requirements

Describe how the project's prime contract will be administered, e.g., administration retained by Commandant (G-ACS) at Coast Guard Headquarters, Administrative Contracting Officer (ACO) oversight established at the contractor's site or other location, or a Project Resident Office (PRO) established at the contractor's site or other location. If a PRO is established, specify the approximate size, location and the specific functions of the organization. Discuss how the contractor's effort will be monitored, including, as appropriate, any management system to be used, e.g., earned-value.

6. Government Furnished Information and Property

Identify any information such as manuals, drawings, and test data to be provided to prospective offerors and contractors. Identify any property to be furnished contractors, including facilities and material, and discuss any associated considerations, such as its availability or the schedule for its acquisition.

Section D. Other Considerations

1. Priorities, Allocations and Allotments

A project may be authorized for preferential or priority treatment to support national defense under the Defense Productions Act of 1950, as amended. If so, specify the method for obtaining and using priorities, allocations, and allotments, and the reasons for them. See Federal Acquisition Regulation Subpart 11.6.

2. Make or Buy

Discuss any consideration given to make or buy programs. See Federal Acquisition Regulation subpart 15.407.

3. Environmental Considerations and Energy Conservation

Identify any environment issues and energy conservation objectives associated with the system and the need for an environmental assessment or environmental impact statement. Discuss how environmental issues will be resolved and any environmentally related requirements that will need to be included in solicitations and contracts.

4. Security Considerations

For projects dealing with classified matters, indicate how security will be established, maintained, and monitored.

5. Other Issues

Discuss other relevant issues such as the industrial readiness programs, and the Occupational Safety and Health Act (OSHA) not covered elsewhere.

Section E. Participants in Acquisition Strategy Developments

List major participants in the strategy development and give contact information for each.

Section F. Milestones for the Acquisition Cycle

Provide a schedule showing when significant events (e.g., solicitation issuances; contract awards; KDPs; Test and Evaluation; system deliveries; Initial Operational Capability; etc.) are planned. Updated APs should show actual dates for completed tasks as well as planned future events.

c. Test and Evaluation Planning

(1) Purpose

This section establishes the process and procedures for Test and Evaluation (T&E) for preparation, review, and approval of Test and Evaluation Master Plans (TEMP), and subordinate test and evaluation planning documents.

(2) Test and Evaluation Concepts

The fundamental purpose of test and evaluation in an acquisition project is to verify attainment of technical performance specifications, and operational effectiveness and suitability. During the early phases of the project, test and evaluation is conducted to demonstrate the feasibility of conceptual approaches, minimize design risk, identify design alternatives, analyze tradeoffs, and estimate operational effectiveness and suitability. As a system undergoes design, development, and integration, the emphasis in testing moves gradually from Developmental Test and Evaluation (DT&E), which is concerned chiefly with validating the contract requirements and the attainment of engineering design goals and manufacturing processes, to Operational Test and Evaluation (OT&E), which focuses on questions of operational effectiveness, suitability, and supportability.

(a) Developmental Test and Evaluation

Developmental Test and Evaluation (DT&E) is conducted to demonstrate that the engineering design, integration, and development process is complete and contract requirements have been met. DT&E is used by the contractor to reduce risk, validate the design, and to ensure that the product is ready for government acceptance. DT results are evaluated to ensure that design risks have been minimized, to determine that the system meets specifications, and to estimate the system's utility when it is introduced into the field. Finally, DT&E is the tool used by the government to confirm that the system performs as technically specified, and that the system is ready for operational testing. In summary, DT&E is an iterative process of design, build, test, identify deficiencies, fix, retest, and repeat, if necessary.

(b) Operational Assessment

For those projects that do not require Independent Operational Assessment (IOA)/ Independent Operational Test and Evaluation (IOT&E), the Sponsor may elect to conduct an Operational Assessment (OA) in order to make an early assessment of operational effectiveness and operational suitability based on the results of DT&E. The OA is normally performed during the Concept and Technology Development Phase and is used to reinforce the KDP 2 decision to enter System Development and Demonstration. For projects, which will have a Low Rate Initial Production (LRIP) phase, OA may also be used to support the LRIP decision. The OA should be conducted in the same manner as the IOA, but will be conducted by the Sponsor/Sponsor's Representative in lieu of the IOTEA. It should be noted that OA is optional, but highly recommended.

(c) Independent Operational Assessment

IOA is an independent assessment which is required to be conducted by an Independent Operational Test and Evaluation Advisor (IOTEA) for all projects which require IOT&E, see paragraph 4.4.b(2)(d). It is conducted in order to make an early assessment of operational effectiveness and operational suitability based on the results of DT&E. The IOA is normally performed during the Concept and Technology Development Phase and is used to reinforce the KDP 2 decision to enter System Development and Demonstration. For projects, which will have a LRIP phase, IOA may also be used to support the LRIP decision.

(d) Operational Test and Evaluation

Operational Test and Evaluation (OT&E) is conducted to assess operational effectiveness and operational suitability, to identify deficiencies and the need for modifications to meet operational requirements, and to develop operating tactics. Operational effectiveness is a measure of the ability of the system to safely accomplish its mission under actual deployment conditions. Operational suitability is a measure of the maintainability, reliability, supportability, and survivability of the system, the effort and level of training required to maintain, support, and operate it, and any unique logistic or training requirements. OT&E is conducted by the government and is performed using production representative systems and typical operational personnel. OT&E may also provide information on doctrine, organization, and personnel requirements, and may be used to assist in the revision or verification of operating and maintenance instructions and other publications. Follow-On Operational Test and Evaluation (FOT&E) may be conducted on the deployed (production) system to determine if operational effectiveness and suitability requirements are attained. In summary, OT&E provides an evaluation of the utility of the system and the feasibility of deploying it. (Note: Under some circumstances, e.g., for one-of-a-kind systems, formal OT&E may not be required. This decision must be fully justified in the TEMP.)

(e) Independent Operational Test and Evaluation

Independent Operational Test and Evaluation (IOT&E) is required to be conducted by an Independent Operational Test and Evaluation Advisor (IOTEA) for all projects with an acquisition cost exceeding $500M (unless waived by the AE) and any other projects designated by the AE. A recommendation of whether IOT&E should be conducted shall be included in the Acquisition Strategy Proposal (to be submitted within six months of KDP 1). In addition to the $500M threshold, other factors that should be considered in whether to require IOT&E include technological risk, impact on other Coast Guard projects, new requirement vs. repetitive/replacement, intermodal implications, public sensitivity/visibility, and programmatic risks. IOT&E consists of an independent assessment of the OT&E activities conducted by the Sponsor and focuses on whether operational suitability and operational effectiveness are attained, primarily by assessment of Critical Operational Issues (COIs) found in the ORD. The results of IOT&E, an assessment of operational effectiveness and operational suitability, are provided in an IOT&E Report submitted directly to the Acquisition Executive (AE) to support entry into the Production and Deployment Phase.

(f) Differences between Developmental Test and Evaluation and Operational Test and Evaluation

There are a number of fundamental differences between Developmental Test and Evaluation (DT&E) and Operational Test and Evaluation (OT&E). DT&E focuses on meeting detailed technical specifications; OT&E focuses on the actual functioning of the system in a realistic operational environment and provides an assessment of the system's potential to satisfy the user's requirements. It is possible for a system to pass DT&E by meeting all technical specifications and requirements, yet fail OT&E because it does not meet the Sponsor's operational effectiveness and operational suitability goals; i.e., it does not achieve its operational mission requirements. Table 4-8 highlights the major differences between DT&E and OT&E.

Differences between Developmental Test and Evaluation and Operational Test and Evaluation	
Developmental T&E	Operational T&E
• Controlled by Project Manager	• Directed by Sponsor
• Prototype/developmental test articles	• Production/production representative test articles
• Specially selected and trained personnel	• Typical operational personnel
• Controlled operating schedule and environment	• Typical operating schedule and environment
• Development contractor involvement	• No development contractor involvement
• Specific performance measurements and goals	• Operational effectiveness and suitability measures

Table 4-8, Differences Between DT&E and OT&E

(3) Test and Evaluation During Each Project Phase

The Test and Evaluation (T&E) activities conducted during each phase of a typical acquisition are shown in Figure 4-4 and are discussed below. The information provided represents a typical sequence of testing events, but the acquisition strategy for a particular project may require one or more discretionary KDPs. In those situations, the test and evaluation process must be tailored to meet the testing needs driven by the specific acquisition strategy employed.

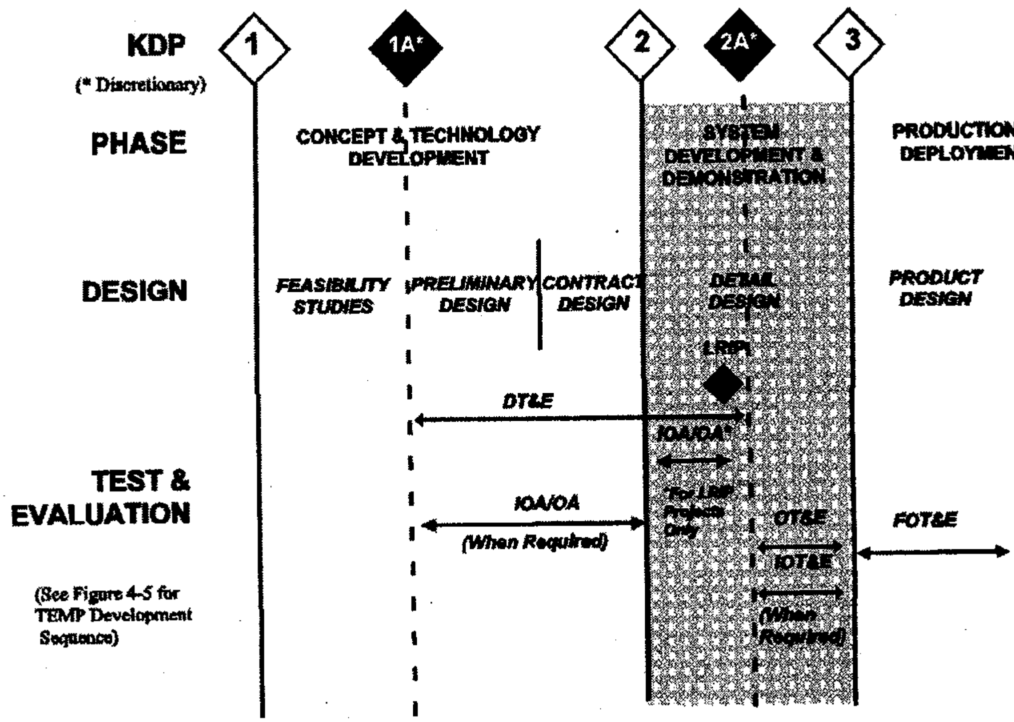


Figure 4-4, Test and Evaluation Process

(a) Concept and Technology Development Phase

System performance thresholds and Critical Operational Issues (COIs) are developed in parallel with operational requirements definition. Initial test planning is conducted. DT&E is conducted to determine which system design concept best satisfies the mission requirements. If only one concept is being considered, DT&E is still conducted to verify design and integration efforts. Concept and Technology Development (CTD) Phase test results are presented to the CGARC to support the decision to enter System Development and Demonstration (SDD). For those projects that require IOT&E, IOA is normally conducted to support the decision to enter SDD. For those projects where OA is conducted, OA will support the decision to enter SDD.

(b) System Development and Demonstration Phase

DT&E continues to determine the design maturity of the system; to determine if it meets established performance thresholds; to reduce risk to an acceptable level; and to confirm system readiness for OT&E. Often, the final step prior to OT&E is a Preliminary Acceptance Trial (PAT) or First Article Test performed on the first unit. OT&E is normally conducted at the end of this phase to determine the operational effectiveness and suitability of the system and its support. OT&E results along with DT&E results are provided to the CGARC to support the decision to enter production. For projects in which IOT&E is required, IOA may be performed to support the LRIP decision. For those projects where OA is conducted, OA will support the decision to enter LRIP. When required, IOT&E is conducted and the results also are used by the AE to support the production decision.

(c) Production and Deployment Phase

Production Acceptance Testing and Evaluation (PAT&E) is typically conducted on each production unit to determine its acceptability. Preliminary Acceptance Trials (PATs) may be held for each unit at the time of delivery. Final Acceptance Trials (FATs) may be conducted for each unit prior to the expiration of warranty. During the Deployment Phase, Follow-On Operational Test and Evaluation (FOT&E) may be conducted on the first production system to determine if it retains the operational effectiveness and suitability demonstrated during SDD. FOT&E is also used to confirm that any changes made to the production version due to the results of OT&E retain their operational effectiveness and operational suitability.

(4) Roles and Responsibilities

(a) Project Manager

The Project Manager (PM) is responsible for coordinating the overall T&E program. The PM performs this task with the assistance of the Sponsor/Sponsor's Representative, Support Program Managers (including logistics and training), an Independent Operational Test and Evaluation Advisor (if required), and testing organizations. The PM is responsible for conducting DT&E. Under the Sponsor's management of OT&E, the PM provides technical and funding support. The PM must coordinate program activities with the test community, especially the testing organization. The PM must also ensure that testing addresses the critical operational issues and that it provides feedback to the contractors. T&E functions performed by the PM are shown in Table 4-9.

PM T&E Functions
• Prepares the TEMP
• Updates the TEMP
• Prepares the DT&E Plan
• Prepares the DT&E Report(s)
• Assists the Sponsor in preparing the IOA Plan or OA Plan and the OT&E Plan
• Reviews and comments on draft OT&E Report
• Provides interface between the development contractor and the government testing community

Table 4-9, PM T&E Functions

(b) Sponsor/Sponsor's Representative

Prior to DT&E, the Sponsor is responsible for defining the system's required operational characteristics in the Operational Requirements Document (ORD). The Sponsor is responsible for identifying Critical Operational Issues in the ORD which provide the focus and direction of OT&E. The Sponsor has the lead role in OT&E, while the PM takes on a technical monitoring role. The T&E functions normally performed by the Sponsor's Representative on behalf of the Sponsor are shown in Table 4-10.

Sponsor's Representative T&E Functions
• Reviews and comments on TEMP
• Prepares Section E of the TEMP
• Reviews and comments on TEMP Updates
• Assists PM in preparation of the DT&E Plan
• Reviews and comments on the final DT&E Report
• Determines Critical Operational Issues
• Prepares the IOA Plan or OA Plan and the OT&E Plan
• Prepares the OA Report (if required)
• Conducts/Manages OT&E
• Prepares the OT&E Report
• Reviews and comments on IOT&E Reports, after they have been submitted directly to the AE

Table 4-10, Sponsor's Representative T&E Functions

(c) Independent Operational Test and Evaluation Advisor

For projects requiring Independent Operational Test and Evaluation (IOT&E), an Independent Operational Test and Evaluation Advisor (IOTEA) will be designated by the AE to provide independent assessment (IOA) of DT&E and OT&E (IOT&E). The IOTEA must be independent of Commandant (G-A) and the Sponsor, and must not have had any involvement in the development of the project. The IOTEA should be carefully selected for each required project, with the focus being placed on operational experience and expertise. Specific functions performed by the IOTEA are shown in Table 4-11.

Independent Operational Test and Evaluation Advisor T&E Functions
• Advises the AE (as required)
• Provides review and comment on TEMP and TEMP Updates
• Provides input on the DT&E Plan, IOA Plan and the OT&E Plan
• Concurs with the IOA Plan and the OT&E Plan
• Provides an early independent operational assessment (IOA)
• Prepares the IOA Report
• Provides independent oversight and assessment of OT&E (IOT&E)
• Prepares the IOT&E Report

Table 4-11, Independent Operational Test and Evaluation Advisor T&E Functions

(d) Test Management Oversight Team

For all major acquisition projects, a Test Management Oversight Team (TMOT) shall be established and serve as the primary test management planning forum. The TMOT will be chaired by the project T&E Manager, representing the PM. The TMOT should consist of representatives from each organization involved in the overall T&E program for the particular project. Commandant (G-A-2) will serve as an advisor to the TMOT. **The IOTEA, when required, shall not be a member of the TMOT**. Another key role of the TMOT is to be the vehicle for the IOTEA to discuss testing issues with the developer and the acquirer while maintaining independence. Specific T&E functions performed by the TMOT are shown in Table 4-12.

Test Management Oversight Team T&E Functions
• Serves as the primary test management planning forum
• Serves as the primary point of contact for the IOTEA
• Assists the PM in preparation of the TEMP
• Assists the PM in updating the TEMP
• Assists PM in preparing the DT&E Plan
• Reviews and comments on the final DT&E Report
• Assists the Sponsor in preparing the IOA Plan or the OA Plan and the OT&E Plan
• Assists in the execution of the DT&E Plan and the OT&E Plan

Table 4-12, Test Management Oversight Team T&E Functions

(e) Other Members of the Test and Evaluation Organization

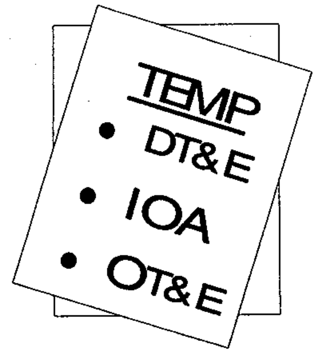
Depending on the nature and complexity of a particular project, a number of other organizations may play a role in T&E, and should be considered as members of the TMOT. These organizations include those shown in Table 4-13.

Other Test and Evaluation Organizations
• Support Program Managers
• Coast Guard Research and Development Center (R&DC)
• Telecommunications and Information Systems Command (TISCOM)
• Command and Control Engineering Center (C2CEN)
• Operations Systems Center (OSC)
• Operational units
• Testing organizations (e.g., government or contractor laboratories, test tanks, test ranges, etc.)

Table 4-13, Other Test and Evaluation Organizations

(5) Procedures for Plans and Reports

(a) Test and Evaluation Master Plan



1. Test and Evaluation Master Plan Function

The Test and Evaluation Master Plan (TEMP) is the basic "top-level" planning document for all T&E related to a particular major acquisition. The TEMP supports and evolves from the Project Management Plan (PMP). Its primary purpose is to describe the necessary Developmental Test and Evaluation (DT&E) and Operational Test and Evaluation (OT&E), including Operational Assessment (OA), Independent Operational Assessment (IOA), and Independent Operational Test and Evaluation (IOT&E). The TEMP identifies all critical technical characteristics and operational issues and describes the objectives, responsibilities, resources, and schedules for all completed and planned T&E. It also describes all subordinate plans (e.g., DT&E Plan, OA Plan, IOA Plan, OT&E Plan) and required reports (e.g., DT&E Report, OA Report, IOA Report, OT&E Report, IOT&E Report), and it assigns responsibility for preparing and approving these plans and reports.

2. Preparation

The PM shall prepare a TEMP in accordance with Exhibit 4-4 as early in the project as possible, but no later than three months after approval of the initial PORD/ORD. If the initial PORD/ORD is prepared in support of a KDP (either 1A or 2), the initial TEMP shall be prepared to support that KDP. See Figure 4-5 for guidance on the TEMP development sequence. The TEMP may be a supporting document to any KDP decision documentation forwarded to the AE. The TEMP development sequence is illustrated in Figure 4-5. The PM should prepare the draft TEMP in consultation with all Program and Support Managers and other organizations involved in the T&E activities (e.g., Coast Guard R&D Center, U.S. Navy COMOPTEVFOR, etc.) that are represented on the TMOT.

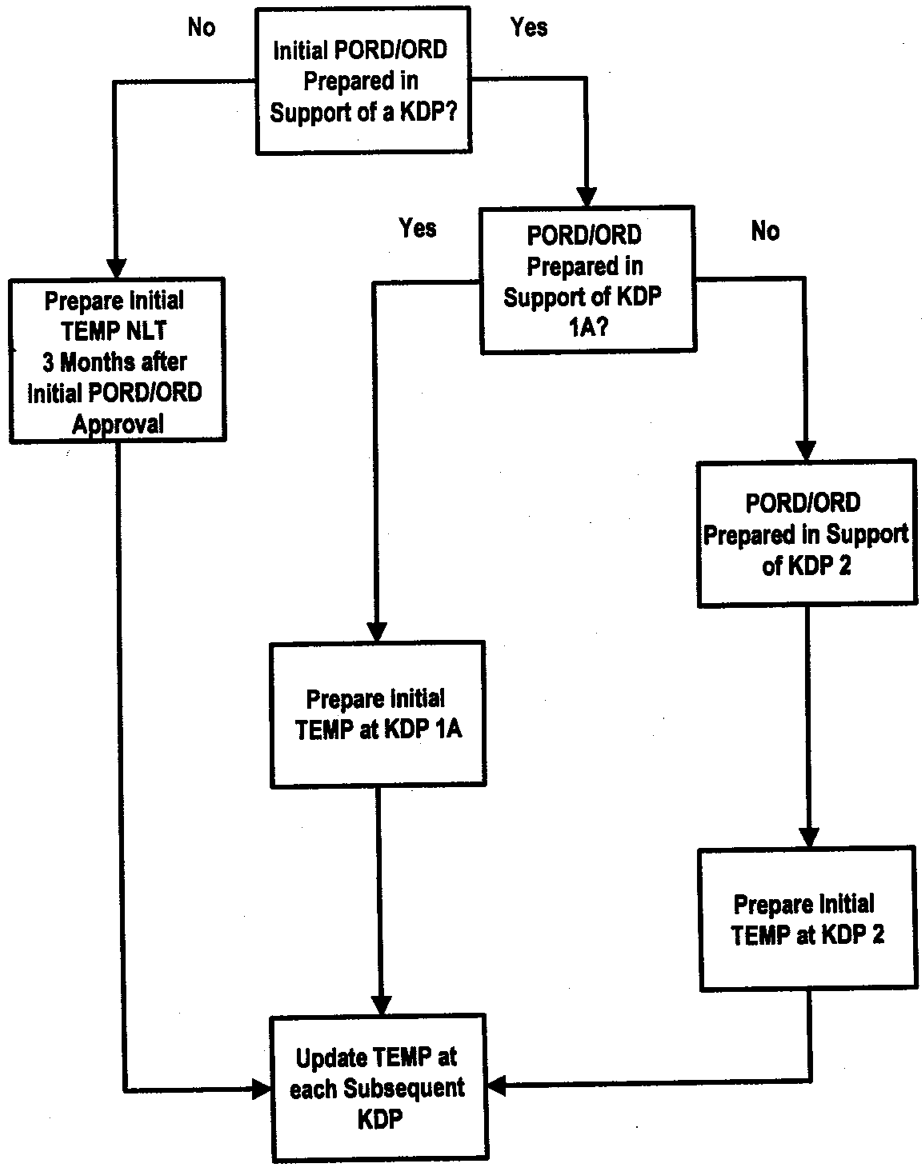


Figure 4-5, TEMP Development Sequence

3. Review and Approval

A Matrix-level concurrent clearance review, consisting of the TMOT member organizations plus the IOTEA, shall be conducted in accordance with the procedures in Chapter 6. If matrix/TMOT-level review results in a non-concur response, receipt of substantive comments, or a significant change to the TEMP, a CGARC-level concurrent clearance may be required. After resolution of any matrix concerns, the PM will provide the document package to the CGARC Executive Secretary recommending whether the document should be routed for CGARC concurrent clearance. After resolution of matrix and/or CGARC concerns, and following the CGARC meeting (if supporting a KDP), the TEMP is routed for approval. For projects, which do not require IOT&E, the TEMP is submitted by the

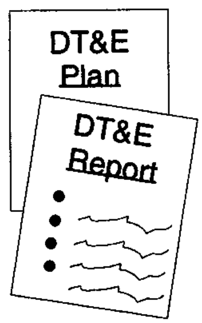
PM, endorsed by Commandant (G-A) and the Sponsor, and approved by the Chief of Staff, Commandant (G-CCS). For projects which require IOT&E, the TEMP is submitted by the PM, endorsed by Commandant (G-A), the Sponsor, and Commandant (G-CCS), and approved by the AE, Commandant (G-CV).

4. Updates

The TEMP is a dynamic document and requires regular updating. As a minimum, the TEMP shall be reviewed and updated as required prior to each KDP after KDP 1, and may be provided as a supporting document to the respective decision documents forwarded to the AE. In addition, the TEMP shall be updated if significant changes in T&E testing procedures, schedule, or resource requirements occur. All changes to the TEMP should be denoted by change bars in the right margin. The approval process for TEMP Updates shall be in accordance with the paragraph above.

(b) Developmental Test and Evaluation Plans and Reports

1. Developmental Test and Evaluation Plan



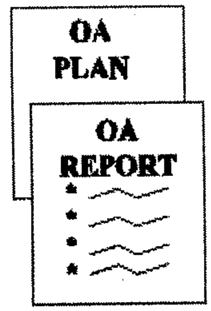
Provides detailed information, guidance, scheduling, and tasking for all planned Developmental Test and Evaluation (DT&E). The DT&E Plan is prepared by the PM with the assistance of the TMOT. Following consensus of the TMOT through Concurrent Clearance, the DT&E Plan shall be approved by Commandant (G-A). Recommended changes should be submitted to the PM for consideration by Commandant (G-A).

2. Developmental Test and Evaluation Report

Provides the results of all developmental testing; the results are used to support the decision to move on to OT&E. For projects which include LRIP, the DT&E Report will also support the decision to enter LRIP. Upon receipt of all data and subordinate reports required by the TEMP and DT&E Plan, the PM will prepare the DT&E Report. A draft copy of the report shall be sent to the Sponsor/Sponsor's Representative for review and comment. The final DT&E Report will be signed by the PM and forwarded to Commandant (G-A); it will also be made available to the CGARC to support entering OT&E and/or LRIP. When applicable, a copy of the report will be sent to the IOTEA.

(c) Operational Assessment Plans and Reports

1. Operational Assessment Plan



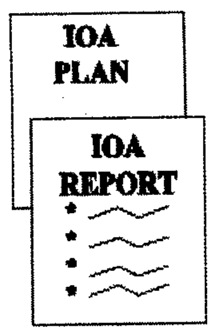
For projects where the Sponsor has elected to conduct OA, the OA Plan is prepared by the Sponsor/Sponsor's Representative with the assistance of the PM and the TMOT; it provides detailed information, guidance, scheduling, and tasking for planned OA. The OA Plan shall undergo a Concurrent Clearance review by the TMOT. Following resolution of any concerns, the Sponsor shall submit the OA Plan to Commandant (G-A) for endorsement prior to Sponsor approval.

2. Operational Assessment Report

For projects electing to conduct OA, the OA Report is prepared by the Sponsor's Representative and signed by the Sponsor; it summarizes the results and conclusions of the OA process to assess how well the design is expected to meet the Critical Operational Issues. The OA Report is used to support the decision to enter the System Development and Demonstration Phase or the LRIP Phase, as appropriate. Copies of the report will be provided to the CGARC members.

(d) Independent Operational Assessment Plans and Reports

1. Independent Operational Assessment Plan



For projects requiring IOT&E, the IOA Plan is prepared by the Sponsor/Sponsor's Representative with the assistance of the PM, the TMOT, and the IOTEA; it provides detailed information, guidance, scheduling, and tasking for planned IOA. The IOA Plan shall undergo a Concurrent Clearance review by the TMOT and the IOTEA. If the IOTEA does not concur with the IOA Plan, and the problems cannot be resolved at the TMOT level, the reasons for the non-concurrence shall be submitted in writing to the AE for resolution. Following resolution of any concerns, the Sponsor shall submit the IOA Plan to the AE for approval via Commandant (G-A) for endorsement.

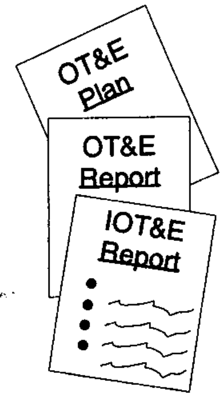
2. Independent Operational Assessment Report

For projects requiring IOT&E, the IOA Report is prepared by the IOTEA; it summarizes the results and conclusions of the IOA process to assess how well the design is expected to meet the Critical Operational Issues.

The IOA Report is submitted directly to the AE and is used to support the decision to enter the LRIP Phase or the System Development and Demonstration Phase, as appropriate. Copies of the report will be provided to the Sponsor and Commandant (G-A).

(e) Operational Test and Evaluation Plans and Reports

1. Operational Test and Evaluation Plan



Provides detailed information, guidance, scheduling, and tasking for all planned OT&E, including IOT&E. Note that there is not a separate IOT&E Plan. The OT&E Plan is prepared by the Sponsor/Sponsor's Representative with the assistance of the PM, and for projects requiring IOT&E, the IOTEA. The OT&E Plan shall undergo a Concurrent Clearance review by the TMOT and the IOTEA, if required. If the IOTEA does not concur with the OT&E Plan, and the problems cannot be resolved at the TMOT level, the reasons for the non-concurrence shall be submitted in writing to the AE for resolution. Upon resolution of any concerns, the OT&E Plan shall be jointly approved by the Sponsor and Commandant (G-A) if IOT&E is not required. For projects requiring IOT&E, the Sponsor shall submit the OT&E Plan to the AE for approval via Commandant (G-A) for endorsement. Recommended changes should be submitted to the Sponsor/Sponsor's Representative for consideration by the Sponsor and Commandant (G-A).

2. Operational Test and Evaluation Report

Supports the KDP 3 decision to enter the Production and Deployment Phase. After receipt of all data and subordinate reports, the Sponsor/Sponsor's Representative will prepare the OT&E Report, which should include a recommendation whether or not to enter production. A draft copy will be sent to the PM for review and comment. The final report will be signed by the Sponsor and forwarded to CGARC for consideration. The Sponsor/Sponsor's Representative should be prepared to brief the CGARC on the results of OT&E and make a recommendation regarding production.

3. Independent Operational Test and Evaluation Report

For projects requiring IOT&E, an IOT&E Report shall be prepared by the IOTEA; it summarizes the results and conclusions of OT&E and assesses how well the system met the Critical Operational Issues. The report shall be submitted directly to the AE and shall contain a recommendation as to whether the system is ready to enter the Production and Deployment Phase. Copies of the IOT&E report will be provided to the Sponsor and Commandant (G-A). Copies will be made available to all CGARC members for consideration at KDP 3.

(6) Documentation Contents and Format

Exhibit 4-4 presents sample TEMP Cover Pages (one for projects which do not require IOT&E, and one for those which require IOT&E), and a sample TEMP Table of Contents, and content and format requirements for a TEMP. There are no content and format requirements established for subordinate T&E Plans and Reports.

SAMPLE TEST AND EVALUATION MASTER PLAN

Cover Page

(For Projects Which Do Not Require IOT&E)

Test and Evaluation Master Plan (TEMP)
for the

PROJECT TITLE

Submitted by: ____________________ __________
Project Manager (G-AXX) Date

Endorsed by: ____________________ __________
Project Director (G-A) Date

Endorsed by: ____________________ __________
Project Sponsor (G-X) Date

Approved by: ____________________ __________
Chief of Staff (G-CCS) Date

Sample Test and Evaluation Master Plan

Cover Page

(For Projects Which Require IOT&E)

Test and Evaluation Master Plan (TEMP)
for the

PROJECT TITLE

Submitted by: ______________________ ____________
Project Manager (G-AXX) Date

Endorsed by: ______________________ ____________
Project Director (G-A) Date

Endorsed by: ______________________ ____________
Project Sponsor (G-X) Date

Endorsed by: ______________________ ____________
Chief of Staff (G-CCS) Date

Approved by: ______________________ ____________
Acquisition Executive (G-CV) Date

Sample Test and Evaluation Master Plan

Table Of Contents

Exhibit 4-4 (cont.)

8. Future Operational Test and Evaluation
9. Operational Test and Evaluation Plans and Reports
10. Independent Operational Test and Evaluation Overview
11. Independent Operational Test and Evaluation Reports

Section E. **Test and Evaluation Resource Summary**

1. Summary
2. Resource Summary Updates

Enclosures

1. Bibliography
2. Acronyms
3. Points of Contact

Annexes

Test and Evaluation Master Plan

Content Requirements

Executive Summary

Provide an Executive Summary of the Test and Evaluation Management Plan. The Executive Summary should be a brief (one or two pages) discussion of the Plan, highlighting the salient points of each chapter in the Plan. Be sure to include the goals and objectives of the Plan and expected outcomes. Briefly discuss the roles and responsibilities of key participants and discuss reports expected to be prepared and how the reports will support project decisions.

Section A. Introduction

1. Background

Briefly summarize the mission of the deployed system. Briefly describe the system design. Include key features and subsystems; describe unique characteristics of the system or unique support concepts which may result in special test and analysis requirements (e.g., rollover tests for Motor Lifeboat). Do not repeat detailed background information included in the PMP; focus should be on test and evaluation issues.

2. Operational Performance Requirements

- List in matrix format (see Table 4-14) the minimum acceptable operational performance requirements. Candidates for inclusion in the list are those included by the Sponsor in the ORD Section C, Mission Requirements, and highlighted in the Acquisition Project Baseline (APB).
- Table 4-14 contains examples of operational performance requirements with their associated parameters and thresholds. Thresholds, against which each of the effectiveness and suitability parameters will be measured, are normally quantitative. Thresholds should represent the level of system performance acceptable to the user to successfully execute the mission.

3. Critical Technical Parameters

- List in a matrix format (see Table 4-15) the critical technical parameters of the system from Section IV of the ORD that have been evaluated or will be evaluated during the remaining phases of DT&E.
- For each technical parameter, list the appropriate technical threshold as illustrated by Table 4-15. Table 4-16 contains examples of critical technical parameters.
- Highlight critical technical issues that must be demonstrated before entering the next acquisition phase or before entering OT&E.

Operational Effectiveness		
Requirement	Parameter	Threshold
Speed	Minimum Top Speed	25 Knots
	Continuous Speed (Sea State 2)	20 Knots
Operational Suitability		
Requirement	Parameter	Threshold
Reliability	Mean Time Between Maintenance Actions	1000 Hours
	Mean Time Between Failures	2000 Hours
	Mean Time Between Critical Failures	5000 Hours
Maintainability	Mean Time To Repair	2.5 Hours
Operational Availability	Percentage Of Time Available To Start Mission	80%

Table 4-14, Examples of Operational Performance Requirements (with their parameters and thresholds)

Project Title - Critical Technical Parameters					
Critical Technical Parameter	Test Event	Technical Threshold	Test Location	Test Schedule	Decision Supported
Stability	Model Test	Self-right through 360°	U.S. Naval Academy	DT	Preliminary Design Completion
Stability	Static Roll-over	Self-right through 360°	Contractor	DT	Preliminary Acceptance
Minimum Top Speed	Model Test	25 Knots	U.S. Naval Academy	DT	Preliminary Design Completion
Minimum Top Speed	Speed Trials	25 Knots	Contractor	PAT	Preliminary Acceptance

Table 4-15, Sample Critical Technical Parameters Matrix

Cutters & Boats	Aircraft
Length	Speed
Beam	Maneuvering
Draft	Overall Endurance
Speed	On-scene Endurance
Maneuvering	Range
Endurance	Design Life
Range	Maximum Gross Weight
Damage Control	Cargo Capacity
Design Life	Personnel Capacity
Ship Control	Navigation
Seakeeping	Communications
Human Factors	Major Equipment
Safety/Environmental Health	Human Factors
Armament	Safety/Environmental Health
Outfit	Survivability Systems
Major Equipment	
Survivability Systems	
IT	**Radars**
Architecture Compliance	Range
Speed of Calculation	Detection Limits
Memory Utilization	Jamming Protection
Throughput Capability	Reliability
Reliability	Error Rate/Signal Processing
Software Maintainability	Human Factors
Information Management	
Security Controls	
Human Factors	

Table 4-16, Examples of Critical Technical Parameters

Section B. Program Summary

1. Integrated Schedule

- Graphically display the integrated time sequencing of the critical T&E phases and events. Figure 4-6 is provided for illustrative purposes only. The PM may use any graphical technique that clearly shows the key T&E events and their sequential relationship.

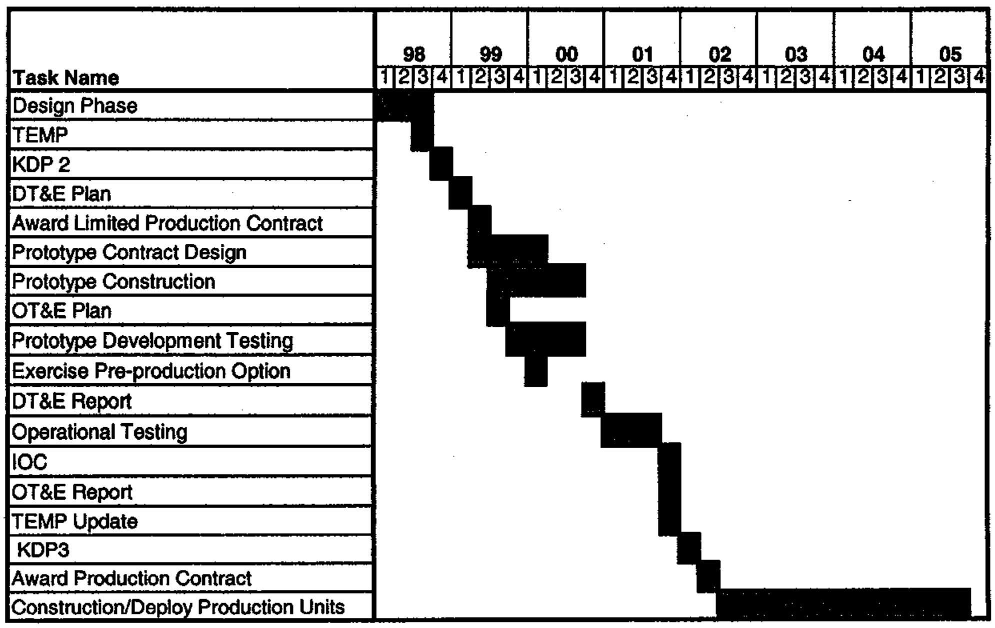


Figure 4-6, Sample Integrated Schedule (Fiscal Years)

- Include event dates related to the testing program, such as Key Decision Points, test article availability, appropriate phases of DT&E, OA, IOA, OT&E, and IOT&E, Initial Operational Capability (IOC), Full Operational Capability, and Low Rate Initial Production (LRIP), if applicable. Include all T&E planning documents (TEMP, DT&E Plan, OA Plan, IOA Plan, and OT&E Plan) and T&E reports (DT&E Report, OA Report, IOA Report, OT&E Report, and IOT&E Report).

2. Management

Identify all organizations, which will be participating in the T&E program. Discuss in detail the roles and responsibilities of each of the identified organizations. Organizations which must be included in the T&E program include the Project Manager, the Project Sponsor and Sponsor's Representative, the TMOT, the Independent Operational Test and Evaluation Advisor (IOTEA) when required, and any organization conducting actual testing, including contractors. Other organizations, which could be included, depending on the nature and extent of the testing program, include Support Program Managers, the Coast Guard R&D Center, the Project Resident Office (PRO), and operational units.

Section C. Developmental Test And Evaluation Outline

1. Developmental Test and Evaluation Overview

Discuss the overall goals and objectives of the DT&E program. Explain how the planned (or accomplished) DT&E will verify the status of the engineering design and development progress, verify that design risks have been minimized, and substantiate the achievement of technical performance. This section should also address:

- any technology which has not demonstrated its ability to contribute to system performance and ultimately fulfill mission requirements; and
- the degree to which system hardware and software design has stabilized so as to reduce manufacturing and production decision uncertainties.

2. Developmental Test and Evaluation to Date

Describe all DT&E which has been conducted to date. Include all DT&E conducted by both contractors and the government. Briefly note the results of the testing and reference all reports completed or under preparation.

3. Future Developmental Test and Evaluation

Discuss all remaining DT&E that is planned, beginning with the date of the current TEMP revision and extending through completion of production. Place emphasis on the testing which will occur during the upcoming acquisition phase. For each segment of testing (e.g., modeling, laboratory tests, in-plant tests, at-sea tests), the following topics should be discussed.

(a) Configuration Description

Summarize the functional capability of the system configuration (model, mock-up, prototype) and how it differs, if any, from the planned production model.

(b) DT&E Objectives

State the test objectives for the phase in terms of the critical technical parameters to be confirmed. Identify any specific technical parameters which an Acquisition Decision Memorandum or legislative action has directed to be demonstrated during a particular phase of testing.

(c) DT&E Events, Scope of Testing, and Basic Scenarios

Summarize the test events, test scenarios, and the test design concept. Quantify the testing in terms of the number of test events planned, and discuss the information which will be expanded upon in the DT&E Plan. Discuss the environment in which testing will be conducted and how realistic that environment is. Describe any models or simulations that will be used and justify their use.

(d) Limitations

Discuss any test limitations that may significantly affect the evaluator's ability to draw conclusions and make recommendations concerning the critical technical parameters.

4. Special Developmental Test and Evaluation Topics

Discuss any areas of special interest that have not been addressed previously. These areas will vary from project to project, but may include:

- Logistics Supportability;
- Reliability, Maintainability, and Availability (RMA);
- System Safety, Human Factors Engineering;
- Software Test and Evaluation;
- Manpower, Personnel, and Training (MPT);
- Survivability;
- Environmental Concerns;
- Interoperability with Other Coast Guard or Agency Systems;
- Electromagnetic Effects; and
- Vulnerability.

5. Developmental Test and Evaluation Plans and Reports

Describe all required DT&E plans and reports. Include information on the scope of each plan or report, who prepares it, who reviews it, who approves it, and when it is to be submitted.

Section D. Operational Test And Outline

1. Operational Test and Evaluation Overview

Discuss the overall goals and objectives of the OT&E program, including any combined DT&E/OT&E and all OT&E, OA, IOA, and IOT&E. Discuss how OT&E is structured to ensure that an operationally effective and operationally suitable system is delivered to the Sponsor. Provide information to show how OT&E will (or has) evaluate the system in an environment as operationally realistic as possible; i.e., using typical operators, expected ranges of natural environmental conditions, and expected operational scenarios.

2. Critical Operational Issues

- List the Critical Operational Issues (COIs) that have been identified by the Sponsor in the ORD. COIs are the operational effectiveness and operational suitability issues (not characteristics, parameters, or thresholds) that must be examined in OT&E to evaluate/assess the system's capability to perform its mission.
- A COI is typically phrased as a question that must be answered in order to properly evaluate the operational effectiveness (e.g., Will the system possess sufficient maneuverability [speed, power, and control] to operate in its intended open water environment?) and operational suitability (e.g., Will the system be maintainable within the planned funding base, rate structure, and expertise level at support facilities?)
- Some COIs will have required operational characteristics, parameters, thresholds, and/or evaluation criteria associated with them. Attainment of individual attributes does not necessarily guarantee that a particular COI has been resolved; the evaluators must use their collective best judgement to determine if a COI has been favorably resolved.
- The list of COIs should be thorough enough to ensure that, if every COI is resolved favorably, the system will be operationally effective and operationally suitable when employed in its intended environment by typical users. The list of COIs will normally consist of five to ten issues and should reflect only those that are truly "critical" in nature. **Thus, if a COI cannot be favorably resolved, the acquisition should not proceed to production.**

3. Operational Assessment Overview

For those projects electing to conduct OA, provide an overview of the OA effort. Describe the objectives of OA and how they will be met. Describe any OA, which has been completed, and discuss all remaining OA.

4. Operational Assessment Plans and Reports

For those projects electing to conduct OA, describe all required OA plans and reports. Include information on the scope of each plan or report, who prepares it, who reviews it, who approves it, and when it is to be submitted.

5. Independent Operational Assessment Overview

For those projects requiring IOT&E, provide an overview of the IOA effort. Describe the objectives of IOA and how they will be met. Describe any IOA, which has been completed, and discuss all remaining IOA.

6. Independent Operational Assessment Plans and Reports

For those projects requiring IOT&E, describe all required IOA plans and reports. Include information on the scope of each plan or report, who prepares it, who reviews it, who approves it, and when it is to be submitted.

7. Operational Test and Evaluation to Date

Briefly describe all OT&E that has been completed; if none has been conducted, so state. The descriptions should include the following:

- A description of the system actually tested and how its configuration relates to the system that will be fielded.
- A summary of the actual testing that occurred, including events, scenarios, resources used, test limitations, evaluations conducted, results achieved, and a reference to any test report detailing the results of such testing. Emphasis should be upon those Critical Operational Issues that were resolved, partially resolved, or unresolved at the completion of that portion of testing.

8. Future Operational Test and Evaluation

For all remaining OT&E, address the following:

(a) Configuration Description

Identify the system to be tested, and describe any differences between the tested system and the system that will be fielded. Include, where applicable, the extent of integration with other systems with which it must be interoperable or compatible. Characterize the system (e.g., first article, production representative, or production configuration).

(b) Operational Test and Evaluation Objectives

State the test objectives including the Critical Operational Issues to be addressed during remaining OT&E and the Key Decision Point(s) supported. OT&E which supports the Production and Deployment Decision (KDP 3) should have test objectives that examine all areas of operational effectiveness and suitability.

(c) Operational Test and Evaluation Events, Scope of Testing, and Scenarios

Summarize the scenarios and identify the events to be conducted. Indicate the type of resources to be used, the simulation(s) to be employed, the type of representative personnel who will operate and maintain the system, the status of logistic support, the operational and maintenance documentation that will be used, and the environment under which the system is to be employed and supported during testing. This section should also identify planned sources of information (e.g., developmental testing, modeling, and simulations) that may be used by the operational testers to supplement this phase of OT&E. Whenever models and simulations are to be used, explain the rationale for their credible use.

(d) Limitations

Discuss the test limitations including the mission realism, resource availability, limited operational environments, limited support environment, maturity of tested system, safety, etc., that may impact the resolution of affected COIs. Indicate the COI(s) affected in parentheses after each limitation.

9. Operational Test and Evaluation Plans and Reports

Describe all required OT&E plans and reports. Include information on the scope of each plan or report, who prepares it, who reviews it, who approves it, and when it is to be submitted.

10. Independent Operational Test and Evaluation Overview

For those projects requiring IOT&E, provide an overview of the IOT&E effort. Describe the objectives of IOT&E and how they will be met. Describe any IOT&E, which has been completed, and discuss all remaining IOT&E.

11. Independent Operational Test and Evaluation Reports

For those projects requiring IOT&E, describe all required IOT&E reports. Include information on the scope of each report, who prepares it, who reviews it, who approves it, and when it is to be submitted.

Section E. Test and Evaluation Resource Summary

1. Summary

Provide a summary (preferably in a table or matrix format) of all key T&E resources, both government and contractor, which will be used during the course of the acquisition program. Specifically, the TEMP shall identify the following test resources:

(a) Test Articles

Identify the actual number of and timing requirements for all test articles, including key support equipment and technical information required for testing in each phase of DT&E and OT&E. If key subsystems (components, assemblies, subassemblies, or software modules) are to be tested individually, before being tested in the final system configuration, identify each subsystem in the TEMP and the quantity required. Specify when prototypes, development pre-production or production models will be used.

(b) Test Sites and Instrumentation

Identify the specific facilities/test ranges to be used for each type of testing. Compare the requirements for facilities/test ranges dictated by the scope and content of planned testing with existing and programmed facility/test range capability, and highlight any major shortfalls. Identify instrumentation that must be acquired specifically to conduct the planned test program.

(c) Test Support Equipment

Identify test support equipment that must be acquired specifically to conduct the test program. Identify unique or special calibration requirements associated with any such equipment.

(d) Threat Systems/Simulators

For those systems that have Defense Operations missions, identify the type, number, and availability requirements for all threat systems/simulators. Compare the requirements for threat systems/simulators with available and projected assets and their capabilities. Highlight any major shortfalls.

(e) Test Targets and Expendables

Identify the type, number, and availability requirements for all targets, flares, chaff, sonobouys, smoke generators, acoustic countermeasures, etc., that will be required for each phase of testing. Identify any major shortfalls.

(f) Operational Program Test Support

For each T&E phase, identify the type and timing of aircraft flying hours, boat hours, and/or cutter underway days, and other critical operating program support required.

(g) Simulations, Models, and Testbeds

For each T&E phase, identify the system simulations required, including computer-driven simulation models and hardware-in-the-loop testbeds (a system representation consisting partially of actual hardware and/or software, and partially of computer models or prototype hardware and/or software). The rationale for their credible usage or application must be explained in an approved TEMP before their use.

(h) T&E Administrative Support

For each test phase, identify all administrative and facilities support required. Identify the organization responsible for providing such support and the source and type of funding required. Such items as office space and equipment, pier or hangar space, and maintenance services should be discussed.

(i) Manpower and Training

Identify manpower and training requirements and limitations that affect test execution.

(j) Technical Interfaces

Identify any technical interface areas, which need to be addressed during the T&E program. Possible topics include:

(1) Value Engineering (VE)

If a Value Engineering program is in place, improvements identified during T&E may be implemented under the VE clause of the contract. Describe the procedure, which will be used to direct VE changes to the system, including the identification of the responsible VE officer.

(2) Warranty Management

Describe any warranty implications, which T&E may affect. For example, if a prototype or first article is being tested, how are repairs and defects handled under the warranty clauses of the contract? Identify the responsible Warranty Officer and describe the process under which warranty provisions will be invoked.

(k) Special Requirements

Discuss requirements for any significant non-instrumentation capabilities and resources, such as: special data processing or databases, unique mapping or charting products, extreme environmental conditions, or restricted or special use air/sea/landscapes.

(l) T&E Funding Requirements

Estimate, by Fiscal Year and appropriation type, the funding required to pay direct costs of planned testing, as shown in Figure 4-7. Identify any major shortfalls.

Test and Evaluation Funding ($K)								
	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02
RDT&E	25	50	100					
AC&I				100	250	100		
OE						100	150	50
Total	**25**	**50**	**100**	**100**	**250**	**200**	**150**	**50**

Figure 4-7, Test and Evaluation Funding

2. Resource Summary Updates

The initial TEMP should project the key resources necessary to accomplish DT&E and OT&E. As system acquisition progresses, test resource requirements shall be reassessed and subsequent TEMP updates shall reflect any changed system concepts or requirements.

Enclosures

The following documents should be attached as enclosures to the TEMP.

1. Bibliography

Cite in this enclosure all documents referred to in the TEMP. Also cite all reports documenting developmental and operational testing and evaluation of the system.

2. Acronyms

List and define all acronyms used in the TEMP.

3. Points of Contact

Provide a list of Points of Contact for all participating organizations (Project Manager, Sponsor, Support Program Managers, IOTEA, testers, evaluators, etc.) List TMOT members (by organization).

Annexes

Provide other enclosures or attachments as required.

d. Integrated Logistics Support Planning

(1) Purpose

This section establishes requirements, processes and procedures for Integrated Logistics Support (ILS) planning and the preparation, review and approval of Integrated Logistics Support Plans (ILSPs) during the acquisition of new Coast Guard systems/equipment.

(2) Background

The life cycle of any system/equipment encompasses three major phases: acquisition and fielding, sustainment, and disposal. During the acquisition and fielding phase, the system/equipment is designed, developed, tested, and delivered to the operational community. During the sustainment phase, the system/equipment is used for its intended purpose in the operational environment. During the disposal phase, the system/equipment is removed from the operational inventory due to its replacement with a newer item or because it is no longer needed by the operational community.

In addition to the new system/equipment, the resources needed to support it during the sustainment phase must be developed, procured and fielded during the acquisition phase. This can be referred to as Acquisition Logistics versus Sustaining Logistics. Acquisition Logistics requires careful planning, early and throughout the process, to ensure the necessary logistics resources are acquired at an optimal cost. A new hardware system/equipment that is fielded can be anticipated to remain in operation for ten to twenty years or longer (fifty or more years in many cases). The costs associated with the sustainment period will normally be many times greater (by a factor of at least 3 to 4) than the acquisition costs. Thus, it may be feasible to achieve a significant reduction in the total life cycle cost with an increase in the cost associated with the acquisition phase (assuming that the additional acquisition funds are available). This normally is not the case, however, with software acquisitions. Software development cost is determined by the level of effort required to develop, package, and test the software code, with little or no affect on either reliability or maintainability. However, expending the necessary resources during acquisition and development to ensure detailed, well-defined user requirements are identified, and then rigorously testing the application to ensure all requirements are adequately satisfied and coding errors have been eliminated will result in a high quality product being delivered. This will reduce or eliminate the need for software revisions to be made immediately after deployment.

ILS planning during the acquisition phase involves the application of a diverse set of technical disciplines to assure effective, suitable and economical system/equipment life cycle support. ILS planning influences system design and selection requirements definition and achievement from the start of the acquisition process. The ILS objectives in acquisition, illustrated in Figure 4-8, are to:

- Identify the logistics constraints and define the resultant logistics support requirements.
- Identify or define the system during its design and development to ensure it can be cost effectively supported within the logistics constraints and requirements that are identified. The system design should be optimally supportable while still satisfying all performance requirements.
- Design the logistics support system and support structure appropriately for the system that is being acquired. The logistics support system and support structure must be defined and established in terms of each logistics element consistent with support requirements and existing infrastructure, policies and regulations, and available resources.
- Acquire and field the necessary logistics resources in a timely and cost effective manner to achieve system readiness requirements. Ensure each required support resource is available in the appropriate quantity, at the required time and place.
- Transition a fully functioning logistics support capability to the Support Program Manager for use during operation and sustainment. Provide any necessary interim support that is required between the time the system is initially fielded and the planned support posture is in place.

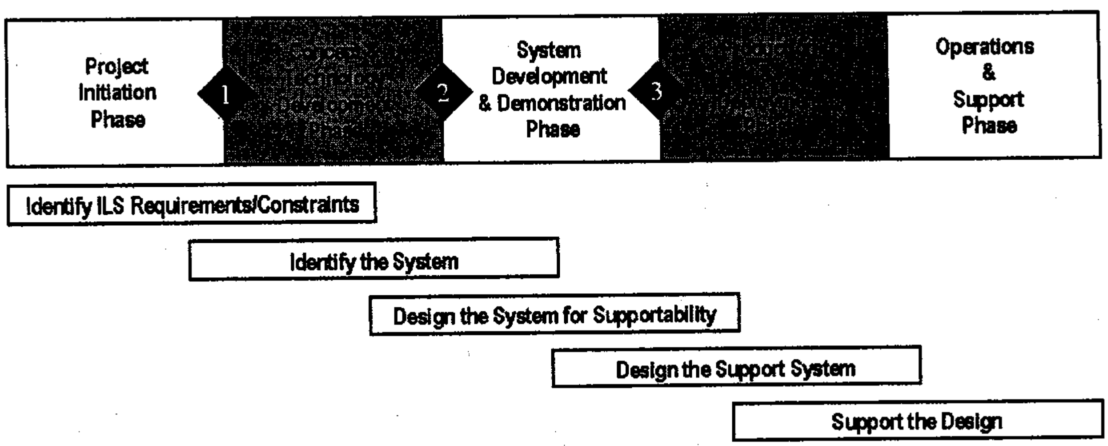


Figure 4-8, ILS Objectives in the Acquisition Process

(3) ILS Elements

Logistic support planning will be structured around the following ten (10) ILS elements and the effects of related programs or disciplines for hardware and software. Definitions of these logistics elements are provided in Acquisition and Management of Integrated Logistics Support (ILS) for Coast Guard Systems and Equipments, COMDTINST 4105.2 (Series). Additional information concerning the elements can be found in the Acquisition Logistics Guide published by the Defense Systems Management College.

- Maintenance Planning
- Manpower and Personnel
- Supply Support
- Support Equipment
- Technical Data
- Training and Training Support
- Facilities
- Packaging, Handling, Storage and Transportation
- Computer Resources Support
- Design Interface

(4) Supportability Analysis/Logistic Support Analysis

Supportability analysis like the term Logistics Support Analysis, refers to an analytical process conducted on an iterative basis through all phases of the system life cycle. These analyses provide the interface between logistics and related programs or disciplines through the system engineering process. MIL-STD-1388-1A, Logistics Support Analysis identified a set of detailed logistics support analysis processes from which a tailored supportability analysis program could be derived. Specific kinds of analyses were identified along with how they were to be accomplished and how the resulting information was to be documented. With the advent of acquisition reform, DOD has developed and issued a performance specification (MIL-PRF-49506, Logistics Management Information) which provides the capability of developing this tailored supportability analysis program without specifying the procedures to be followed. Requirements for logistic management information are to be identified by the government, and the specific analyses and procedures are left to the discretion of the agency responsible for accomplishing the analyses. MIL-HDBK-502, Acquisition Logistics, published as a companion document to MIL-PRF-49506, provides guidance on acquisition logistics as an integral part of the systems engineering process.

Supportability analyses form the basis for decisions on the scope and level of logistics support and lead to performance requirements in the system specification and thus influence design considerations. Table 4-17 identifies the supportability objectives in acquisition. Additional application guidance is available from Logistic Support Analysis, COMDTINST 4105.3 (Series) and the Office of Logistics Policy, Commandant (G-SLP).

Supportability Objectives
• Influence hardware design/selection
• Specify requirements for logistic resources and services
• Assess supportability
• Avoid duplication of analyses
• Provide central database linking logistics with other engineering efforts

Table 4-17, Supportability Objectives

Significant time and dollar savings may be achieved by carefully selecting a database for collecting the information resulting from these supportability analyses early in the acquisition process. The selection, level of detail, and timing of supportability analytical tasks must be tailored to each system or item of equipment. Several analytical models exist to choose from. Supportability analyses are ongoing throughout the system development cycle in iterative fashion. The initial analyses should focus on the relationships of the evolving operational and readiness requirements, planned support structures, and comparisons with existing force structure and support posture. The following are some examples of supportability analyses, which might be performed:

(a) Use Study

The use study analyzes the intended operational mission usage of the system/equipment after it is fielded to include how, where, when, and in what environments it is to be used; human factors implications associated with its operational use; anticipated service life; and standardization and interoperability requirements. It also includes the identification of quantitative factors such as operational availability, transportation modes/times, allowable maintenance periods, and environmental requirements (including hazardous materials, hazardous wastes, and other pollutants). The depth of analysis and amount of effort associated with the use study will vary. However, a complete understanding of these factors is crucial to both system engineering and logistics to ensure the system/equipment and the support system will adequately satisfy the mission requirements after fielding. The use study is applicable to new design systems/equipment, major modifications to an existing system/equipment, and Contractor off-the shelf/Non-Developmental Item (CANDI) systems/equipment.

(b) Reliability, Maintainability and Availability Analyses

Reliability, Maintainability and Availability (RM&A) analyses are applicable to hardware items, but have very little application to software applications. All hardware items will eventually fail in some form regardless of all prevention efforts. Software, on the other hand, does not fail in the true sense of the word. Any instance of a software application not performing properly is a result of faulty design, a change in requirement for which the design does not accommodate, or the introduction of something into the application which corrupts it.

1. Reliability Analysis

Reliability has been defined as the probability that an item will perform its intended functions for a specified period of time under stated conditions. Reliability requirements, if identified, are specified for an end item of equipment or system, and are normally specified in terms of operating hours instead of calendar hours. Reliability analysis for a new design predicts how frequently each component within the end item at the lowest level of indenture will fail, and mathematically rolls up the reliability predictions through each successive higher indenture level until the end item reliability prediction is derived. Reliability for an existing design system may be obtained from actual operational performance data.

2. Maintainability Analysis

Maintainability is the probability that an item will conform to specified conditions within a given period when corrective or preventive action is performed in accordance with prescribed procedures and resources. This may be expressed in terms of either clock hours or labor hours but must include the number of personnel required for accomplishment of the task.

3. Availability Analysis

Availability is a measure of the degree to which an item is in the operable state and is ready to commit at the start of a mission, even when the mission is called for at an unknown (random) time. Availability is based on the efficacy of the supply support and maintenance systems as well as the Reliability and Maintainability (R&M) characteristics, and may be weighted by operational parameters identified during the use study.

(c) Failure Modes, Effects, and Criticality Analysis

Failure Modes, Effects, and Criticality Analysis (FMECA) is an analysis procedure whereby each potential failure mode in a system is analyzed to determine its results or effects on the entire system (including any effects on the integration between subsystems). The analysis then classifies each potential failure mode according to its severity. The severity (or criticality) of identified failure modes is determined by the resulting effects on mission capabilities identified during the Use Study. The results of the FMECA must then be utilized in the design process to reduce the probability of failures through design modification. The FMECA concept has been combined with the Reliability Centered Maintenance concept in SAE JA1011 and SAE JA1012, published by SAE (Society of Automotive Engineers) International.

(d) Reliability Centered Maintenance Analysis

Reliability Centered Maintenance (RCM) analysis uses information from FMECA to identify items most critical to system availability, and determines appropriate actions for preventing their occurrence or mitigating their effects. The level of criticality at which RCM analysis is to be applicable must be identified by the requiring activity. The purpose of the analysis is to develop a scheduled maintenance program with the goal of increasing system availability by identifying failures or potential failures before they degrade system effectiveness. If scheduled maintenance actions cannot be effectively implemented, potential redesign areas are identified.

(e) Detailed Task Analysis

The detailed task analysis is the heart of the process to identify required logistics support resources for a new system/equipment. Each operator and maintenance task identified in the previously identified analyses is subject to a detailed, sequential step-by-step analysis to identify all actions, procedures, and resources needed for its accomplishment. Both preventive maintenance tasks (scheduled maintenance actions to prevent a failure from occurring) and corrective maintenance tasks (unscheduled maintenance actions to correct failures which have occurred) are included in the analysis. Specific personnel (type/rate, skill level, and quantity) requirements, replacement parts requirements, additional or special training requirements, support equipment requirements, special facility requirements, computer resource requirements, technical manual source information, and Packaging, Handling, Storage and Transportation (PHS&T) requirements are identified. Using the frequency of occurrence information from the Use Study (operator tasks), Reliability, Maintainability and Availability Analyses and Reliability Centered Maintenance Analysis (corrective and preventive maintenance tasks), and any other analyses that are accomplished, serves to quantify these requirements.

(f) Other Analyses

Other analyses (i.e., Level of Repair Analysis; Manpower, Personnel and Training Analysis; Performance Situation Analysis; Facilities Analysis; Postproduction Support Analysis; etc.), specific to a particular logistics element or area of interest/concern may be advisable or required. Requirements for analyses should be tailored to the specific needs of the acquisition project.

(5) Logistics Planning Considerations for Commercial and Non-Developmental Items

Commercial and Non-Developmental Items (CANDI), a widely used acquisition consideration for the Coast Guard, can require special planning. The use of CANDI acquisition strategies capitalizes on cost effective, readily available items that usually have established support and distribution systems. The CANDI strategy lends itself to accelerated acquisition and fielding. However, the logistics requirements and support risks (including the support schedule and cost) must be weighed before adopting this streamlined approach. CANDI items should be considered if a product meets the Government's operational requirements and will function in the operational environment for which it is being purchased. CANDI items should not be modified to avoid creating unique Government items, support requirements, and costs. Quite often technical data, data rights, and configuration management are not available with CANDI components. The use of CANDI subsystems within a larger end-item system does not imply the end-item system is CANDI.

Maintenance and support may be constrained by the component manufacturer. In such cases reverse engineering and subsequent system engineering design are likely to be required when a CANDI component is changed out. This is particularly true with high tech components subject to rapid design change. Care must be taken that resources are not wasted building support that will not be used and that the operational support community knows that engineering resources will likely be required for these components at such a time as they are changed out/updated. In many cases, the use of CANDI components results in the requirement to develop hardware or software interfaces to facilitate their use and integration into the end item system or equipment. These interfaces then become development items that require the development of appropriate support.

Selecting a CANDI solution to an acquisition does not imply that any logistics element can be ignored. However, in arriving at logistics decisions regarding CANDI, a departure from traditional methods of acquiring logistics support may be necessary. Logistics design influence (in order to optimize system supportability) may not be available since the design of the system/equipment has already been finalized. To ensure logistics considerations are incorporated effectively during the CANDI acquisition process, thorough and coordinated planning for supportability should be developed in conjunction with developing acquisition strategy. Planning for deployment and postproduction support must accentuate the accelerated nature of CANDI acquisitions and address potential problems involved with logistics lagging the availability of the system/equipment. During the logistics planning process, analysis should be made regarding the utilization of the system/equipment. Logistics support decisions must include consideration of the fact that there may not be an ideal solution to support, and some aspects of the CANDI support may be less than optimal. It may be more expeditious and cost effective to procure life-cycle logistics support through a logistics support contract rather than developing additional infrastructure and procuring the necessary items to develop an organic support posture. Logistics support contracts are being used more frequently to provide operational system support than in the past.

(6) Acquisition of Software Applications/Programs

Software acquisitions should be managed and engineered using best processes and practices that are known to reduce cost, schedule, and technical risks. Software systems should be designed and developed, in accordance with the Coast Guard Enterprise Information Technology (IT) Architecture Framework described later in this chapter. Software development should be based on systems engineering principles, which include the following.

- Developing software system architectures that support open system concepts, exploit commercial computer systems products, and provide for incremental improvements based on modular, reusable, extensible software.
- Identifying and exploiting software reuse opportunities, government and commercial, before beginning new software development.
- Making programming language selections in the context of the system and software engineering factors that influence overall life-cycle costs, risks, and potential for interoperability with existing systems.
- Selecting contractors with the domain experience in developing comparable software systems, a successful past performance record, and a demonstrable mature software development capability and process.
- Using software metrics to effect the necessary discipline of the software development process and assess the maturity of the software product.

All application software shall be architecturally compliant with the Coast Guard's Enterprise IT Architecture as promulgated by Commandant (G-CIT). For application systems with DoD interoperability requirements or other DoD requirements, the DoD C4ISR Architecture Framework applies and meets this requirement.

The Chief Information Officer (CIO), Commandant (G-CIT), must review all software initiatives for compliance. This review must be conducted during the Concept & Technology Development (CTD) Phase to minimize technical risk.

Software is present throughout a typical system/equipment, in both mission-critical applications programs and the related support structure. Acquisition personnel require an understanding of software and firmware within the context of the acquisition process, as well as the traditional understanding of hardware.

Software intended for use on Coast Guard Standard Workstations must be certified by Telecommunications and Information System Command's (TISCOM) Configuration Management Branch. Program managers or software sponsors may obtain instructions and a checklist for preparing an application for Software Certification from TISCOM's (Information Systems) Intranet Web-site. Certification pertains to all software, whether developed for the Coast Guard or purchased commercially. Once approved, a certificate is issued, and a copy of the Certification must be included in each software release.

(a) Software Logistics Considerations

Many of the basic logistics concepts apply to software planning. Design criteria for supportability should be established for software just as they are for hardware. Maintainability should be addressed in detail. The hazards and safety aspects of software malfunctions must be thoroughly examined and eliminated where necessary. Each of the ten elements of logistics support should be considered for the impact of software, just as for hardware. Although logistics concepts for software are similar to those for hardware, there are some key differences.

(b) Key Elements of a Software Support Concept

At the simplest implementation level, a software support concept identifies a software engineering capability with the personnel resources and skills, physical facilities, and support systems to undertake ongoing development and change implementation. A customer/supplier procedural interface, through which queries, change requests, and update products pass, must also be defined. The resources committed to the support function represent a significant part of the software life-cycle costs in terms of both capital investments and operation expenses and should project resources in the out years to cover system upgrades/migrations to ensure data integrity and availability. Judging the optimum scale of this investment involves trading off the costs of support against the operational benefits to be derived. The supportability analyses must provide guidance for a support concept that balances reliability, maintainability, and operational effectiveness with acceptable cost parameters.

(c) Software Support Tasks and Initiator Events

For any computer-based system there will be a number of different situations that could initiate the need for software support task activities. It is important to examine such support initiators and the consequent support requirements at the same time that equipment design alternatives are being considered. The events or situations that may initiate software support task activities should be grouped according to common operation, modification, and logistics management support impact. A set of top-level software support initiator groups should be defined against which the support requirements of the subject software item may be determined. These initiator groups should be adapted as necessary to the individual nature of specific systems and the impact of the software on system use and mission capability. Defining initiator groups, conducting supportability analyses, and identifying an appropriate support concept may be carried out iteratively during the development phase (and even the support phase) of a project. Each iteration should build on the previous analysis and use the results to modify or validate the evolving software support concept. At the earliest development stage, an analysis of support initiators should be undertaken as part of the requirement identification process. The aim should be to ensure that the software design approach takes account of what post-delivery changes may be anticipated. The support capability must be responsive and efficient in satisfying user needs and minimizing the life-cycle cost of support resources.

Design characteristics that affect software supportability include:

- design complexity (including related attributes of software size, structure, and inter-relationships),
- stability and flexibility of the design itself and adequacy of documentation,
- completeness of the software development effort, and
- the extent and implementation of configuration management practices for both operational and support software.

Other factors within the development environment that impact software supportability include:

- availability of qualified software personnel,
- system structure understandability,
- ease of system handling,
- use of standardized programming languages,
- documentation structure standardization,
- test case availability,
- built-in debugging mechanisms,
- availability of original development documentation to the maintenance organization, and
- availability of appropriate computer hardware to conduct maintenance activities.

Software support includes support of government-developed software, contractor-developed software, and commercial software. The following issues should be considered when supporting commercial software:

- The acquisition agent must acquire appropriate documentation and data rights, licensing, and subscription services (such as options to purchase or escrow proprietary information), which allows the government to support the software if contracted support becomes unfeasible.

- The Software Support Activity must maintain appropriate licensing and subscription services (vendor field change orders and software releases) throughout the life of the system. The supporting activity must provide logistics support and provide a contract for subscription services required to update and maintain commercial software assets. It must also evaluate operational and logistics impacts of changes due to subscription-related hardware and software upgrades.

- Commercial software resources must not be altered to preclude contractor logistics support or void licensing or subscription services.

- The operating activity must provide a technical review of proposed changes during upgrades and changes to commercial software assets. It is responsible for evaluating the effectiveness and mission impact of changes due to subscription-related software upgrades.

(7) Roles and Responsibilities

The PM, the Integrated Logistics Support Manager (ILSM) and the Integrated Logistics Support Management Team (ILSMT) perform key functions in acquisition logistics management, design development, and implementation of a successful support system.

(a) Project Manager

The Project Manager (PM) is responsible for establishing and managing an effective ILS program that relates support to project readiness objectives, system design, acquisition and operating cost, and to the acquisition strategy. The PM performs these tasks with the support of an ILSM and the assistance of the ILSMT. PM ILS responsibilities include the following:

- Establish and maintain an ILS program that is adequately funded to implement the requirements of the project.

- Establish and maintain plans to ensure that logistics considerations are addressed and integrated into all project efforts and system design or selection throughout the acquisition process.

- Ensure the Integrated Logistics Support Plan (ILSP) is developed by the ILS Manager and the ILS Management Team.

- Coordinate with the Contracting Officer (KO) to provide government data for contractor ILS planning, as appropriate.

- Ensure that plans are developed for follow-on readiness assessment, beginning with initial deployment and continuing until the system design and the support configuration are mature. These plans should include strategies, responsibilities and milestones for system design and support resource improvements needed to meet system readiness objectives.

- Ensure that plans are developed for software design and support improvements, to meet system readiness and effectiveness goals following deployment. Plans should include resource requirements, milestones, responsibilities, strategies, and software life cycle support.

- Ensure that logistics planning is developed and updated, throughout the acquisition life cycle to determine the most cost-effective means of providing Post-Production Support (PPS). This includes ensuring that plans, resources, and responsibilities are established for effective life cycle support, through disposal, to meet readiness objectives.

- Ensure all logistics support data developed during the acquisition cycle is available to the Facility Manager, Operating Program Manager, or Support Program Manager, as appropriate. Ensure that the logistics support system is in place and suitable, or interim support provisions have been established and implemented, prior to handing-off the first fielded item. Plan for and meet the acquisition Material Support Date (MSD) and Coast Guard Support Date (CGSD).

- Ensure logistics is addressed and incorporated in the Project Termination Plan (PTP).

(b) ILS Manager

The ILS Manager (ILSM) is responsible for formulating, coordinating and implementing the ILS program for the Project Manager. The ILSM is normally a dedicated project management staff member and serves as the project ILS focal point. The ILSM shall be responsible for, at a minimum:

- Establishing, chairing, and convening the ILSMT (this includes ILSMT meeting coordination and scheduling, agenda development and distribution, action item receipt, project and ILS status review, and providing minutes.)

- Coordinating the design, development, and implementation of the ILS system via the ILSMT. This includes ensuring that each ILSP version is appropriately reviewed by all ILSMT members for data accuracy and completeness.

- Ensuring that Integrated Logistics Support Plan (ILSP) development, implementation and maintenance is fully coordinated with the ILSMT and the acquisition project manager.

- Identifying logistics support, funding, resource requirements, potential roadblocks, and other relevant issues to the PM.

- Maintaining current ILS management information (including schedules, resource requirements and funding) to support ILS planning and management decisions throughout the acquisition.

- Ensuring that ILS is included as part of the project contractual requirements. This includes providing logistics support requirements and inputs to the Statement of Work (SOW), Circular of Requirements (COR), specifications, and the Contract Data Requirements List (CDRL). The ILSM shall be an active member of the team responsible for establishing, developing, reviewing and evaluating contractor requirements and deliverables. The ILSM shall coordinate with the PM, the matrix activities, and the Contracting Officer to provide appropriate government data for use in the contract.

- Developing, providing and reviewing logistics deliverables and inputs to project activities and documentation.

- Reviewing project Memoranda of Agreement or Understanding (MOA/MOU), developing logistics related inputs to, or preparing logistics MOAs/MOUs for PM incorporation, approval and signature. If funds or property are exchanged, the MOA/MOU will have to be signed by the Contracting Officer.

- Participating in design reviews and configuration audits to ensure that logistics support is considered throughout the acquisition life cycle.

- Establishing and developing a coordinated ILS system and post production logistics support requirements via the ILSMT. This includes the logistics inputs to the Project Termination Plan (PTP). The ILSM will provide assistance to the PM and Facility Manager, Operating Program Manager, or Support Program Manager, as appropriate, to conduct Post Production Support (PPS) analyses, and facilitate the transition of ILS from acquisition to operations.

- Ensuring that the logistics support system is in place and suitable prior to handing-off the first fielded item. Plan for and meet the MSD and CGSD.

- Provide inputs to the PM's "Lessons Learned".

(c) Integrated Logistics Support Management Team

The Integrated Logistics Support Management Team (ILSMT) is the primary management organization responsible for logistics support planning functions. An ILSMT shall be established during the Concept and Technology Development phase to review, develop, coordinate, and integrate ILS requirements and resolve problem areas. The ILSMT is chaired by the project ILSM. As shown in Table 4-18, the ILSMT consists of members representing various logistics support elements at Headquarters, the ELC or AR&SC, Training Centers, Maintenance and Logistics Commands (MLCs), Field units such as TISCOM and/or OSC, other interested organizations, and contractor representatives, as appropriate for the project. Commandant (G-SLP) is responsible for developing and promulgating Coast Guard wide ILS policy, providing guidance on the policy, and ensuring that the policy is adhered to, and should be included as a member of every ILSMT.

ILSMT Membership
• ILS Manager (Chairperson)
• Facility Manager
• Sponsor's Representative
• Support Managers/Logistics Element Managers
• Office of Logistics Policy (G-SLP)
• Maintenance Activities
• Engineering Logistics Center (ELC) or Aircraft Repair and Supply Center (AR&SC)
• Training Managers/Training Centers
• Software Support Activity (SSA)
• Project Resident Office (as applicable)
• Others (as appropriate) (DoD or other OGAs, support contractors, etc.)

Table 4-18, ILSMT Membership

ILSMT membership must include, at a minimum, one or more Logistic Element Managers (LEMs) responsible for coordinating the logistics support planning for each of the ten ILS elements. The project office is responsible for all elements of ILS, but cannot adequately satisfy all of these responsibilities without active support from expertise that may reside outside the acquisition office. LEMs assigned to the ILSMT for a specific ILS element represent their organizational activity, and function as a focal point and liaison between the project and their organizational activity in the development of the logistics support system and acquisition of required initial logistics support resources by the acquisition project, and coordinating the planning accomplished within their respective activities for transition of logistics support responsibility for sustained operation of the fielded assets. LEM inputs to the ILSMT and the acquisition project must represent the corporate position of the respective organizational activity. Examples of this include: the LEM for Training and Training Support would be a representative from Commandant (G-WTT); the LEM for Supply Support could be a representative from either the Engineering Logistics Center (ELC) or Aircraft Repair and Supply Center (AR&SC), as applicable; the LEM for Facilities would be a representative from Commandant (G-SEC). More than one LEM may be provided from a single area, if deemed appropriate to provide a complete corporate perspective. The LEMs applicable to a software acquisition could be significantly different from those for a hardware acquisition. ILSMT members are responsible for developing, maintaining, and updating appropriate portions of the ILSP, and assisting with the formulation and execution of assigned logistics element planning details in support of the ILSM. In addition to the PM and ILSM responsibilities mentioned before, ILSMT member functional areas and responsibilities include, but are not limited to the following:

1. Facility Manager/Operating Program Manager/ Sponsor's Representative

- Develops mission and operational requirements.
- Develops Operational, Training, and Maintenance Concepts.
- Responsible for hand-off of systems from acquisition and Configuration Management (CM) during the deployment phase.

2. Support Managers/Logistic Element Managers

- Plan for and acquire material, facilities, personnel, and services for assigned elements of logistics support.
- Assume specific responsibility for requirements determination, task execution scheduling, and status reports.
- Prepare required documentation for assigned logistics support elements in support of the ILSM and the acquisition project.
- Review deliverables from project contractors.

3. Headquarters Units and Field Activities

Headquarters Units and Field Activities (i.e., ELC, C2CEN, AR&SC, OSC, TISCOM, Training Quota Management Center, Training Centers, etc.):

- Plan for and assume specific responsibility for requirements determination, task execution scheduling, and status reports for assigned elements of logistics support, notably supply support (provisioning, allowance documents, stock spares procurement); PHS&T; maintenance; and training.
- Prepare required documentation for assigned logistics support elements in support of the ILSM and the acquisition project.
- Review deliverables from project contractors.

4. Project Resident Office (PRO, as applicable)

The Project Resident Office (PRO), as applicable, provides on-site contract management and follow-up functions, including receipt, review, and acceptance approval or disapproval of deliverables.

5. Maintenance and Logistics Commands

Maintenance and Logistics Commands (MLCs), as applicable:

- Provide maintenance, repair and shore support outfitting inputs to acquisition support planning.
- Provide development assistance for system maintenance concepts and plans, preventive maintenance systems, and special tools and test equipment allowances (shared function between ELC, and MLCs).

6. Department of Defense

Because of statutory requirements for interoperability with U. S. Navy systems which have national defense missions, and because Department of Defense (DoD) activities may be a joint participant in or lead service of some major acquisitions, Coast Guard acquisition PMs may look to DoD for some ILS assistance and ILSMT representation.

(8) ILS During Each Acquisition Phase

Effective ILS requires that support resource requirements be considered, defined, and budgeted for from the very beginning of the system development process. The applicable requirements of all ten ILS elements must be concurrently considered and planned. Table 4-19 identifies some of the related directives to be considered in logistics planning. A sample of logistics support tasks performed during each phase of the acquisition process is shown in Figure 4-9.

Logistics Related Directives	
COMDTINST 4105.1 (Series)	ILSP Development and Management Responsibility
COMDTINST 4105.2 (Series)	Acquisition and Management of ILS for Coast Guard Systems and Equipment
COMDTINST 4105.3 (Series)	Logistics Support Analysis
COMDTINST 4105.4 (Series)	Long Range Planning of ILS for Operational U. S. Coast Guard Cutters
COMDTINST 4105.9 (Series)	Manpower and Personnel and Training and Training Support as ILS Elements
COMDTINST M4423.3 (Series)	U. S. Coast Guard Provisioning Manual
COMDTINST 1550.9 (Series)	Management of the Coast Guard's Training System
COMDTINST 1554.1 (Series)	Development and Management of Interactive Courseware (ICW) for Coast Guard Training
COMDTINST M13020.1 (Series)	Aeronautical Engineering Maintenance Management Manual
COMDTINST 9000.6 (Series)	Naval Engineering Manual
COMDTINST M10550.25 (Series)	Electronics Manual

Table 4-19, Logistics Related Directives

Project Initiation	Concept & Technology Development	System Development & Demonstration	Production & Deployment
KDP	KDP	KDP	
• Support philosophy (MNS) • Identify support constraints & resource requirements	• Develop ILSMT • Draft ILSP (consider each alternative) • Logistics support strategy and requirements • Initiate supportability analyses to identify & assess ILS implications for each alternative • PORD/ORD • Maintenance concept and comparative analysis • Assess levels of maintenance required • Preliminary supply support estimates • Initiate manpower requirements analysis • Assess specialized skill requirements & training concepts • Support equipment requirements analysis • Support facilities alternatives • Research technological opportunities • Perform trade-off analysis on alternatives • Begin Design Interface	• Update ILSP for selected alternative • Design logistics support system • Perform detailed trade-off analyses to balance H/W, S/W, support and resource requirements • Test, evaluate, & verify the support system • Determine maintenance levels • Finalize supply support requirements (provisioning) • Stage precomm crews • Train lead crew, maintenance activities, and future instructors • Perform fitting out • Update and finalize supportability requirements • Provide logistics support for OT&E • Identify any interim contractor logistics support required for initial deployment of system • Design/contract training and other human performance interventions	• Update ILSP • Acquire all necessary support (provisioning) • Verify that ILS elements meet deployment needs • Verify supportability requirements • Verify process for staging/fitting out • Correct deficiencies and verify actions from T&E activities • Verify that follow-on training and other human performance interventions are in place • Concurrent deliver of system w/all required support • Provide and track any required contractor support until transition to Coast Guard • Obtain MSD/CGSD • Transition from acquisition to operational support • Post-production support analysis

Figure 4-9, ILS Tasks by Acquisition Phase

(a) Project Initiation Phase

The object of this phase is to develop the justification for project initiation by conducting mission and cost analyses, technology assessments, defining mission requirements and formulating acquisition strategy objectives. The MNS may (and should) define any support constraints that must be satisfied and/or identify mission needs due to an unsupportable system. During this phase, ILS goals and shortfalls for existing systems and equipment are identified. A preliminary support philosophy will be developed incorporating any identified preliminary support constraints, replacement system support improvements and resource requirements. Any support related analyses and studies to be conducted in the next phase will also be identified.

(b) Concept & Technology Development Phase

During the Concept & Technology Development Phase, the project focus is to develop and evaluate alternative design concepts and select the preferred concept. To support this, the PM's focus is on ensuring an ILSM has been assigned to the project and establishing the ILSMT; determining the preliminary logistics support strategy and requirements; identifying and assessing the logistic implications of alternative design and support concepts; selecting the preferred concept(s); and preparing the project ILSP and initial detailed logistic element planning requirements. The applicable support system strategy and analysis tasks for the project will be developed and documented in the ILSP. The focus of the ILSP at this stage should be on logistics support strategy, basic concepts and identification of what needs to be done for each of the ILS elements and what activity is responsible for them. How things are to be done may not be known at this point, and may be developed during the next phase as the system/equipment design effort progresses. Basic concepts for maintenance, supply, staffing, and training are also included in other project planning documents, such as the PORD, ORD, AP, etc. Each of the basic concepts must be subjected to trade-off analysis as the system development or selection process proceeds and alternatives are evaluated and selected. Initial life cycle cost estimates will be developed based on similar or like system data and preliminary requirements estimates.

(c) System Development & Demonstration Phase

The goals of this phase are to demonstrate and validate the design concept selected, reduce technical risk to an acceptable level, complete system design and development, and prepare for either Low Rate Initial Production (LRIP) or full production. If more than one design concept is to be considered in this phase, a comparative analysis of support requirements associated with the alternative system design concepts must be performed. Otherwise, detailed logistics trade-off analyses will be performed to demonstrate and validate the support concepts associated with the selected design concept, and to balance hardware, software, support, and resource requirements. The ILSP will be updated along with the logistics element details, and support inputs to other project activities and documentation. At this stage, preliminary processes, procedures, and methodologies concerning how requirements for each ILS element will be satisfied get identified, refined, and finalized. Logistics support concepts should be finalized during this phase. Any significant change to a logistics support concept after this phase will severely impact the development of an adequate logistics support system in time to be fielded with the new system/equipment that is being acquired. Requirements identified in the Operational Requirements Document for achievement of Initial Operational Capability, Full Operational Capability, and Coast Guard Support Date are addressed, definitized in greater depth, and planning actions are developed and implemented to ensure the requirements are satisfied.

Detailed support analyses are finalized and support system development is initiated. Support system testing, evaluation and verification is performed, as well as early fielding analysis. Maintenance activities are designated, lead crew/initial training is accomplished, supply support requirements (provisioning) are finalized, and fitting out may commence. The ILSP, element details, and other support planning and data are updated to reflect the testing results. At this stage, specific processes, procedures, and methodologies are finalized and start to get implemented. Planning for any required interim support is accomplished. Each of the LEMs on the ILSMT need to be actively involved in planning the interim support provisions. Interim support planning and planning for transition of logistics support responsibility need to be addressed, as applicable, for each ILS element in the ILSP by the time the production/fielding decision is made at KDP 3. The first article system/equipment is delivered for Operational Test and Evaluation. Multiple systems/equipment items may be delivered if LRIP is applicable.

(d) Production and Deployment Phase

The Production and Deployment Phase focuses on finalizing the detailed design for system production (including support), correcting deficiencies and validating corrective actions from test and evaluation activities, and the manufacture and concurrent delivery of the system with its support, acceptance, initial fielding and support, post production support analysis, acquisition project termination and transition to operational support. If the acquisition project is for a one-of a kind system or a web-based software application, there will be no production phase, per se. In these cases, KDP 3 decision is only approval to operationally field the item that has been developed and tested, caveated by any changes that are required as a result of the OT&E. If the acquisition is for a distributed software application, KDP 3 provides the approval for duplication of the necessary quantities of the application and distribution for operational use. Initial Operational Capability, Full Operational Capability, and Coast Guard Support Date milestones are achieved as the required capabilities and ILS resources are fielded and the applicable requirements are satisfied. Any warranty provision applicable to the new system/equipment must be implemented, tracked, and enforced. Key support efforts will focus on follow-on support assessments, updating all support related technical information, developing logistics inputs to post production support planning, the PTP, and project lessons learned.

The final goal of the acquisition logistics effort is to transition the logistics support system and all of its resources to the Support Program Manager. Ideally, this transition would occur simultaneously with operational deployment of the first end item. However, this rarely is achievable. Transition of support for a web-based software application with no new hardware requirement is probably the only time this can realistically be achieved, and maybe not even then. Transition of logistics support usually occurs somewhere between fielding of the first and last end item, and may be accomplished in phases as the necessary infrastructure changes are implemented and/or the necessary support resources become available. A period of interim support, in some form, is usually necessary. Identifying the specific requirements, and planning and implementing the interim support provisions are acquisition logistics responsibilities. Implementation of warranty provisions may be included in interim support or may be totally adjunctive. However, they need to be implemented and enforced either way. Interim support planning is executed and provided, as needed. Transition of logistics support responsibility to the applicable Support Manager should occur when the complete ILS support capability has been achieved and all logistics resources required to support sustained operations have been provided. The transition of support responsibility should be formally documented, and should be effected in conjunction with a formal ILSMT meeting, if possible.

(9) Procedures

(a) Integrated Logistics Support Plan

The Integrated Logistics Support Plan (ILSP) is the master logistic support planning document and is an integral part of the total project planning effort. The ILSP evolves from and supports the Operational Requirements Document (ORD) and the Project Management Plan (PMP). The ILSP contains the top level management direction and decision making information. Its primary purpose is to describe the necessary logistics support activities for each ILS element, to assign responsibility for those activities and establish the schedule for completing those activities, appropriately tailored to the acquisition project. The information contained in the ILSP must represent the actual ILS planning being accomplished by the project and must be consistent with the ILS information and requirements identified in the contract for design and procurement of the system/equipment. Table 4-20 summarizes the ILSP objectives.

ILSP Objectives
• Presents top level view of overall logistics concepts and management
• Designs, develops, and implements the logistics support system
• Provides information and guidance to support decision making
• Serves as basis for:
- Logistic Element Planning
- Logistics in Procurement Package
- Operational Support Planning

Table 4-20, ILSP Objectives

1. Preparation

The PM is responsible for preparation of the ILSP, assisted by the ILSM and the ILSMT. The ILSM shall prepare an initial ILSP during the Concept and Technology Development (CTD) Phase. If a KDP 1A decision is required, the initial ILSP shall be prepared to identify the basic logistics support concepts, constraints and requirements that are applicable to the project. The ILSP shall be prepared in accordance with Exhibit 4-5. The ILSP may be a supporting document to the KDP decision documentation forwarded to the Coast Guard Acquisition Executive (AE). The draft ILSP should be prepared in consultation with the project ILSMT to ensure all appropriate aspects of logistics support are addressed. ILS tailoring considerations for vessel, aircraft, and electronics systems acquisitions are provided by Commandant (G-SLP) and the technical and organizational specialties represented on the ILSMT. The amount of detailed planning information that is included in the initial ILSP will be dependent on the type of acquisition being pursued. In a true developmental project, only the logistics support strategy and basic support concepts within each ILS element may be known. On the other hand, for a true CANDI system/equipment many of the detailed support processes and procedures may be known very early in the acquisition. In cases where specific details are not yet known, the requirements should be identified along with the identity of the activity responsible for developing the details.

2. Review and Approval

A Matrix-level concurrent clearance review, consisting of the ILSMT members, shall be conducted in accordance with the procedures in Chapter 6. If matrix/ILSMT-level review results in a non-concur response, receipt of substantive comments, or a significant change to the ILSP, a CGARC-level concurrent clearance may be required. After resolution of any matrix concerns, the PM will provide the document package to the CGARC Executive Secretary recommending whether the document should be routed for CGARC concurrent clearance. After resolution of matrix and/or CGARC concerns, and following the CGARC meetings, the ILSP is routed for approval. The ILSP is submitted by the PM, endorsed by Commandant (G-A), and approved by the Chief of Staff, Commandant (G-CCS).

3. Updates

The ILSP is an iterative document and will require regular updating. Each successive iteration of the ILSP should contain more of the detailed procedures and processes to be implemented. The ILSP should be reviewed at least annually, or as needed to reflect significant changes due to project dynamics. At a minimum, the ILSP shall be reviewed and updated as required prior to KDP 3, and may be provided as supporting documents to the decision documents forwarded to the AE. In addition, the ILSP shall be updated for any discretionary KDPs, or if significant changes in logistics support concepts or procedures, schedule, or resource requirements occur. Prior to deployment of the system/equipment, the ILSP must contain all of the detailed information needed to be transitioned to the Support Program Manager for use as the initial operational support planning document. The approval process for ILSP updates is identical to that for initial approval cited in paragraph 4.d(9)2 above.

(b) Logistics Element Detail Planning

Logistics element detail planning expands information briefly identified in the ILSP. Element planning details are approved below the CGARC level in accordance with existing organizational policies and procedures. Figure 4-10 shows the relationship of the ILSP and the documented logistic element detail planning. Logistic element detail planning may be in the form of drawings, outlines, lists, reports, plans, etc. developed by Coast Guard, commercial or other agency/department sources. The ILSMT members will assist the ILSM and the PM in identifying the required planning details in the ILSP, as appropriate to the project. The PM and ILSM must coordinate with the ILSMT members to ensure that the required and appropriately tailored documentation is provided.

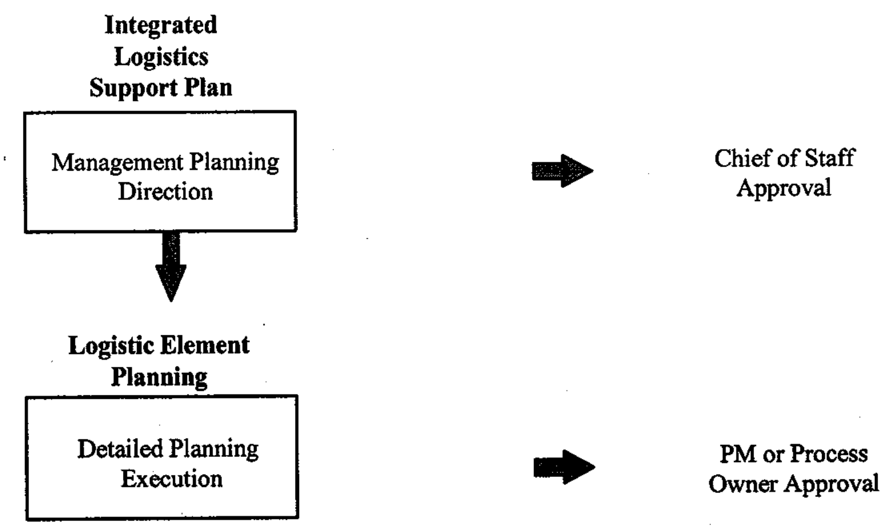


Figure 4-10, ILSP and Logistic Element Planning

It is imperative that information and planning complement the existing operational support infrastructure insofar as feasible. Much of the information required to perform logistics element detail planning tasking originates from the project office. Logistic element details for each ILS element require significant planning and shall include all tasks that are expected to be completed by the ILSMT and it's support organizations. For example, the ILSP will identify and describe the appropriately tailored training concept and will identify the requirement to develop a Master Training List (MTL) and Training Plan. The ILSP will identify who will develop the MTL and Training Plan, when it will be provided, who will approve it, who will review and update it, how often it will be reviewed and updated, and how it will be distributed. The MTL and Training Plan will then be prepared, approved, reviewed, and updated separately from the ILSP. Bulk permitting, logistic element planning details may be included as appendices or addenda to and distributed with the ILSP. Otherwise, the planning details may be distributed separately from the ILSP. Information consistency between the element planning details, the ILSP and other acquisition project management documentation should be maintained to the maximum extent possible.

(10) Documentation

Exhibit 4-5 presents a sample ILSP cover page, a sample table of contents, and the basic ILSP text content and format requirements. The ILSP should address all items listed in Exhibit 4-5. If a particular section is not applicable to the project, the preparer should so state and include a brief rationale. Additional, tailored information should be incorporated with the "core" outline and content requirements.

Exhibit 4-5

Sample Integrated Logistics Support Plan

Cover Page

Integrated Logistics Support Plan (ILSP)
for the

PROJECT TITLE

Submitted by:	Project Manager (G-AXX)	Date
Endorsed by:	Project Director (G-A)	Date
Approved by:	Chief of Staff (G-CCS)	Date

Sample Integrated Logistics Support Plan

Table of Contents

Exhibit 4-5 (cont.)

Section D. Other Program Support

1. **Human Systems Interface**
2. **Configuration Management**
3. **Test and Evaluation**
4. **Miscellaneous**

Section E. Milestones

1. **Logistic Milestone Events**
2. **Logistic Milestone Charts**

Enclosure: Acronyms

Sample Integrated Logistics Support Plan

Content Requirements

Executive Summary

Provide an executive summary of the ILSP. The executive summary should be a brief (one or two pages) discussion of the plan, highlighting the goal, objective, projected outcome and possible constraints/issues of the ILSP. Also discuss salient points of each section in the plan to include the applicable support concepts that are being used. Briefly discuss the roles and responsibilities of key participants and discuss reports expected to be prepared and how the reports will support project decisions.

Section A. Introduction

The introductory chapter of the ILSP should set the stage for ILS planning. In order to develop support for a system, it is essential to know what type of system it is, what it consists of in terms of subsystems and equipment, how and under what conditions it is to be used and the constraints or unique support considerations that must be observed. ILS planning must support and be consistent with an overall support concept. Supportability analyses must be accomplished to generate the specific data required. The types of analyses that are performed dictate the type and detail of information that is generated.

1. General

Briefly describe the objective of the ILSP, list the important topics and summarize the current project status. This paragraph should be very brief and should not attempt to identify the entire history of the project in step-by-step or milestone fashion. It should identify the particular acquisition stage and system/equipment development stage of the project. This sets the stage for determining how much detail should be included in the ILSP and the ILS planning efforts in order to achieve a logistically supported system/equipment when it is operationally fielded. It should also identify the type of system/equipment that is being acquired. This dictates the type of logistics support that will be required. For example, logistics support requirements for a cutter or aircraft are radically different from those for a web-based software application.

2. Background

Briefly summarize the planned mission(s), environment, project service life and current design concept for the deployed system. Include any key features and subsystems. Identify and describe any support constraints or consideration affecting the design concept. Identify and describe any constraints or unique considerations affecting the support planning and reference appropriate project documentation as applicable.

(a) Mission Employment

Identify the planned missions and any known constraints or unique support considerations due to the system/platform mission role or performance requirements.

(b) Operational Environment

Summarize the planned operational environments and identify any known constraints or unique support considerations generated by any operational environment.

(c) Service Life

Identify the planned/projected service life of the system/platform, i.e., the expected time period that the system/platform will remain fully functional and operational.

(d) Current Design Concept/System Description

Initially, there may be multiple design concepts that are considered. Each of them should be identified if this is the case. Identify any known constraints or unique support considerations that each concept presents. As the acquisition progresses, the single design concept to be followed will be finalized. As this occurs, the information in this paragraph needs to be revised, accordingly. Once design of the system/platform commences, a system description should be provided. The system description needs to initially identify the major operating and design features of the system or platform (i.e., system characteristics). By the time the ILSP is updated for KDP 3 (or at such time as a production or fielding approval is provided), the system description should identify major assemblies and sub-assemblies (i.e., engines/propulsion components, weapons, electronics/avionics systems, etc.) by nomenclature, manufacturer, and part number (when applicable) and describe their application to the end item. Identify any software or firmware embedded within the system. For software applications that are being developed for acquisition the system description should identify the version and any modular breakout by identity and function, and any required interface provisions (hardware and/or software), as well as the hardware in which it resides and its operating language. Depending on the complexity and scope of the system/equipment description, the detailed description may need to be incorporated as an appendix or by reference to a completely separate document (or several documents). For any document that is referenced, information must be provided on how a copy can be obtained (preferably electronically).

3. Logistics Support Concepts

Identify the overall logistics support concept, logistics acquisition strategy and support objectives planned for the system/platform. Identify whether the system/equipment being acquired is a totally new capability being introduced or a replacement for an existing capability. Identify whether the new system/equipment will be logistically supported by an existing support infrastructure, a modified existing support infrastructure, or a totally new support infrastructure that must be developed. Identify those existent support infrastructure activities that are anticipated to be used. Identify known areas where new infrastructure assets will be required. Identify any areas where contractor support is anticipated to be used in lieu of developing new infrastructure.

4. Supportability Analysis/Logistics Support Analysis

Describe the methodology being (or to be) used in identifying the logistics support infrastructure and resources needed to support the new system/equipment after it is operationally fielded. Identify if a structured Logistics Support Analysis program like that detailed in MIL-STD-1388-1A; a performance- based Logistics Management Information program like that detailed in MIL-PRF-49506; or some other type of program will be instituted. Identify the supportability related plans, analyses, and data deliverables that are (or will be) included as requirements in the design/development/production contract(s). Identify any analyses that will be accomplished by government activities, the types of information to be obtained by these analyses, and whether the resulting information will be provided to the contractor. Identify who will be responsible for conducting what tasks (Coast Guard/Project Resident Office/matrix, contractor or both), and whether a manual or automated database will be used. Identify who will be responsible for maintaining the database after product delivery.

Section B. Integrated Logistics Support Management

1. Integrated Logistics Support Manager

Identify the roles and responsibilities of the Integrated Logistics Support Manager (ILSM). Include appropriate ILSM responsibilities from the detailed list in Section 4.4.c(3)(b). Specifically identify the responsibility of the ILSM to chair the Integrated Logistics Support Management Team.

2. Integrated Logistics Support Management Team

Describe the Integrated Logistics Support Management Team (ILSMT), its function, and how often it meets. Identify the ILSMT members/participants. Identification should be by activity/office code rather than by individual name, to reduce the frequency of change required. To better associate the ILSMT membership with the logistics elements addressed by the project, identify the functional, technical or ILS element area(s) that each member represents. (The use of tables or figures is encouraged to depict the ILSMT organization and membership.)

3. Integrated Logistics Support Management Team Duties

Since the ILSMT is primarily responsible for the development of the ILSP and support planning details, indicate that each version of the ILSP will be reviewed by the ILSMT for the accuracy and completeness of data. The ILSM will also solicit data inputs from field units. Indicate that these consolidated inputs and review comments will form the basis for validating the accuracy and appropriateness of the data in the ILSP. Identify the applicable duties and responsibilities of the ILSMT Chairperson and member participants. Include appropriate responsibilities from the detailed information in Section D.3.c(3). (This information may be depicted in a consolidated table or figure along with the identification of ILSMT membership.)

Section C. Logistics Support Elements

This part of the ILSP identifies the top level tailoring of the logistic elements to the project (concepts, approach, supporting analysis or basis, and detailed element planning requirements, responsibilities).

1. Maintenance Planning

(a) Concept

Describe the process conducted to analyze, evolve and establish the maintenance concept or philosophy for the project; include the alternatives considered, and the maintenance considerations for the life of the system. An example of the maintenance planning process for Hull, Mechanical, and Electrical (HM&E) and Electronics could be the evolution from Maintenance Support Outlines (MSOs) to Maintenance Support Guides (MSGs). The MSGs evolve into a Preliminary Cutter Class Maintenance Plan (PCCMP), which after verified, evolves into the CCMP for the platform, system, or equipment. Identify and describe the maintenance concept(s) for the particular acquisition project. Include and describe any interim, special, or unique support procedures and program constraints or requirements identified at this time.

(b) Equipment Categories

Provide a brief description of each equipment category applicable to the system. Identify the major system hardware or software components, subsystems, equipment or parts for each of the following categories:

- Hull, Mechanical and Electrical (HM&E) or Airframe
- Electronics (ships) or Avionics (aircraft)
- Electronic HM&E (ships)
- Propulsion (aircraft)
- Electric and Hydraulic/Pneumatic
- Ordnance
- Information Technology (IT) Equipment and System Software

(c) Maintenance Types

There are three general types of maintenance on Coast Guard systems. All three types are normally associated with maintaining a cutter. However, maintenance of aircraft or other type systems require only two types. Computer hardware and some other types of systems may only require one type. Pure software systems (without the associated hardware) may not require any of the three types of maintenance. The ILSP should provide information concerning the maintenance requirements in each of the maintenance types that are applicable. This information should be provided in increasing detail as the acquisition progresses to production and/or deployment. At the time a production/deployment decision is made, the maintenance requirements should be known in complete detail. The specific tasks that are required should be listed or specific references provided concerning where the requirements and accomplishment procedures for the tasks can be found. The three types of maintenance are:

(1) Preventive Maintenance

Preventive maintenance consists of inspection and time change tasks that are routinely and systematically scheduled for the purpose of preventing equipment and system failures that might diminish the operation and safety of the system/platform. Preventive maintenance tasks may be accomplished by crew members or other personnel assigned in direct support of the operating unit, or may be heavy maintenance tasks requiring assistance from a depot maintenance level capability (for example an aircraft programmed depot maintenance inspection or shipyard/ dry dock maintenance for a cutter).

(2) Facility Maintenance

Facility Maintenance consists of those actions such as routine cleaning and painting, which preserve the hull, superstructure, fittings, and protective and decorative coatings on cutters and equivalent actions on land-based systems. The equivalent maintenance tasks for aircraft are normally identified as either preventive or corrective maintenance.

(3) Corrective Maintenance

Corrective maintenance consists of actions that repair equipment, systems, hull, and structure. It is basically random in both time and severity. Corrective maintenance is applicable to all hardware items. The amount and severity of corrective maintenance required may be moderated considerably by preventive maintenance.

(d) Maintenance Levels

The term "maintenance levels" refers to the different levels of capability established within the organizational structure for performing maintenance on, or in support of, the end item system/equipment. Maintenance capability is determined by the tools and equipment, and personnel training provided. The goal of maintenance planning is to provide maintenance capability for the end item system/equipment at the lowest level possible within the constraints of economics and technical feasibility, subject to any overriding operational considerations. Maintenance actions that are more time consuming, require complex expensive equipment, require a lot of training, and can be accomplished off-equipment may be accomplished at a higher level of maintenance. Traditionally, there have been three levels of maintenance: organizational, intermediate, and depot. However, there is a trend towards having only two levels: organizational and depot. Maintenance tasks which formerly would be identified as intermediate level are accomplished at organizational or depot level based on economic criteria or overriding operational constraints. Identify and describe the applicable maintenance levels for the acquisition project, in the terms indicated below.

(1) Organizational Level

Maintenance performed by the owner or user of the end item system/equipment is categorized as Organizational Level (O-level) maintenance. O-level maintenance capabilities are normally limited to periodic servicing, troubleshooting to isolate and identify failures, and removing/replacing components or major assemblies. O-level maintenance is performed on the end item system/equipment and is designed to accomplish those maintenance actions that can be accomplished in the shortest amount of time to maximize operational availability of the system/equipment. Describe the types of maintenance which will be conducted at the organizational level, and by whom it will be accomplished.

(2) Intermediate Level

Intermediate level (I-level) maintenance is a higher level of maintenance capability that normally consists of; calibration, repair or replacement of damaged or unserviceable parts, components or assemblies that have been removed from the end item system/equipment; emergency manufacture of non-available parts; and technical assistance in accomplishing on-equipment tasks that are beyond O-level capability. Identify supporting and unique intermediate level maintenance activities, the services they provide, and procedures required to obtain support.

(3) Depot Level

Depot level (D-level) is the highest level of maintenance capability which provides maintenance on material requiring major overhaul or a complete rebuild/remanufacture of parts, subassemblies or end item components including manufacture of parts, modification, testing and reclamation. D-level maintenance also supports lower levels of maintenance by providing technical assistance and performing complex or heavy maintenance tasks that are beyond their technical capabilities or for which extensive repair facilities and equipment are required. Identify Coast Guard, other government agency (OGA) and contractor depot level support facilities that are required. If interim contractor depot support is used, briefly describe the planned transition to Coast Guard or OGA support, as applicable. As applicable, describe how the project will comply with the Depot Maintenance Interservice (DMI) program requirements of the Joint Logistics Commanders (JLCs).

(e) Miscellaneous

Identify any unique maintenance issues or planning problems (e.g., issues or planning problems new to the Coast Guard or requiring new support infrastructure establishment).

(f) Element Detail Planning

Identify and briefly describe the detailed maintenance planning documentation that will be used to support the project. Note that these details are not part of the ILSP, but will be provided separately. Identify what details will be provided, who will provide them and when, who will approve them, who will review them, who will update them for the life cycle of the project, how often the documentation will be reviewed, and how this information will be distributed. The following list is not all inclusive, but should be considered in providing maintenance planning element details, as appropriate.

- Maintenance Support Outline (MSO), Maintenance Support Guide (MSG), or Maintenance Plans for installed equipments of each applicable equipment category.
- Tri-Level Support Matrix and Coast Guard Planned Maintenance System (CGPMS) (electronics).
- Applicable support analysis results and support system reports/documentation.

2. Supply Support

(a) Concept

Briefly describe the supply support concept for the project. Identify and describe the applicable analyses, management actions, procedures, and techniques used to develop the supply support concept and determine requirements to acquire, catalog, receive, store, transfer, issue, and dispose of secondary items. Include the basis or rationale used to determine provisioning for both initial support and replenishment supply support, including the acquisition of logistics support for support and test equipment. Identify who will be responsible for providing supply support for the fielded/deployed system/equipment, and each applicable inventory control point. Include any planning actions being taken to provide interim contractor supply support or warranty support.

(b) Element Detail Planning

Identify and briefly describe the detailed supply support planning documentation that will be used to support the project and how the information is to be derived. Note that these details are not part of the ILSP, but will be provided separately. Identify what details will be provided, who will provide them and when, who will approve them, who will review and update them, how often the documentation will be reviewed, and how this information will be distributed. The information should identify what items/components/parts are to be stocked at unit level, which ones are to be stocked centrally at each applicable inventory control point, and any items/components/parts for which spares assets will not be stocked. The following list is not all inclusive, but should be considered in providing supply support element details, as appropriate.

- Combined Allowance for Logistics and Maintenance Support (CALMS).
- Electronic Repair Parts Allowance List (ERPAL).
- Electronic HM&E ERPAL.

- Allowance Equipage List (AEL)
- General Use Consumables List (GUCL)
- Ordnance List and Stocking List (aviation only).
- Consolidated Shipboard Allowance List (COSAL) for Navy owned ordnance installed on Coast Guard vessels.
- Reparable Management Summaries or Source, Maintenance and Recoverability (SM&R) Code Listings.
- Unit Supply Support Summaries, Unit and Depot Allowance Parts Lists (APLs) (electronics and aviation).
- Applicable LSA task results, supply support documentation, provisioning list and other provisioning technical documentation per COMDTINST M4423.3 (Series).
- Management Information for Configuration and Allowances (MICA).

3. Training and Training Support

(a) Concept

Give a brief description of the overall training concept for the system, platform or equipment. Describe the front-end analyses or rationale for determining training and training support requirements. Identify any needs analysis or task analysis required or already performed. Identify and briefly describe any special requirements or constraints based upon the particular maintenance, support, and manpower concepts or philosophies identified at this time. Include any training constraints that may have an adverse effect on the system, platform or equipment during its operational missions. Identify who will approve or validate training materials and who will maintain training materials and equipment. Identify any initial contractor training courses to be provided for operator and maintenance personnel, a schedule for these courses to be conducted, and how many students will be trained in each course. If applicable, identify any contractor technical representatives (Tech Reps) to be provided, where they will be located, when they will be in place, and the duration of service to be provided. Identify any training equipment/aids/routines that are embedded in the system/equipment, and any interactive courseware to be used. Ensure training requirements for other organizational elements directly linked to the system, platform or equipment are identified (e.g., Maintenance Augmentation Team (MAT) requirements for gas turbine class). Make a preliminary determination on whether pipeline, mandatory pre-arrival, or unit training is required. Determine if billet specific training is necessary. Identify areas where cross-utilization of personnel could reduce training costs. Make a preliminary determination of the personnel and resource costs associated with the required training. Consider the following:

- Training Allowance Billets (TABs).
- Support Allowance Billets (SABs).
- Funding; including quota costs.
- Instructor and facility costs.
- Training equipment (including any simulators) that is required or desirable. (Also consider the location of this equipment and costs associated with how this equipment will be made available for training purposes.)

Provide an estimate of life-cycle training costs. Include results from cost trade-off analysis of Coast Guard provided versus contractor provided training. Specify funding for post hand-off training tuition and travel by Office.

(b) Element Detail Planning

Identify and briefly describe the detailed training and training support planning documentation that will be used to support the project. Note that these details are not part of the ILSP, but will be provided separately. Identify what details will be provided, who will provide them and when, who will approve them, who will review them, who will maintain and update them for the life cycle of the project, how often the documentation will be reviewed, and how this information will be distributed. Identify any requirements for new/additional training equipment that is required, and how these items will be acquired. The following list is not all inclusive, but should be considered in providing training and training support element details, as appropriate.

- Master Training List(s) (MTL) and Training Plan(s) identifying plans for all required pipeline, resident, exportable, On-The-Job (OJT), dockside, Computer-Based Training (CBT)/Interactive Course (ICW), correspondence, factory, familiarization, initial and follow-on types of training, schedules, class locations, and ranks/ratings required to attend. This should include all required/desired training equipment, its current/intended location, and describe how this equipment will be made available for the project.
- Contractor training deliverables.
- Instructional Plan.

4. Support and Test Equipment

(a) Concept

Identify and briefly describe the supporting analyses for developing the support and test equipment requirements for the project. Include the supporting analyses to identify all mobile or fixed equipment required to support the operation and maintenance of the system and the associated training equipment. Also include the basis for determining requirements for associated multi-use end items, handling and maintenance equipment, tools, metrology and calibration equipment, test equipment, and automatic test equipment. Briefly discuss the Support Equipment (SE) initial outfitting and replenishment concept and responsibilities. List pertinent points of contact and telephone numbers.

(b) Element Detail Planning

Identify and briefly describe the detailed support and test equipment planning documentation that will be used to support the project. Note that these details are not part of the ILSP, but will be provided separately. Identify what details will be provided, who will provide them and when, who will approve them, who will review them, who will update them for the life cycle of the project, how often the documentation will be reviewed, and how this information will be distributed. The following list is not all inclusive, but should be considered in providing support and test equipment element details, as appropriate.

- Built-in Test (BIT) and Built-in Test Equipment (BITE) lists;
- General and Special Purpose Electronics Test Equipment (GPETE/SPETE) allowance lists;
- Ship Portable Electrical/Electronic Test Equipment Requirements List (SPETERL), and Automated Test Equipment (ATE) and associated Test Program Sets (TPSs) index or lists;
- SE exchange pool items lists;
- SE support provisions and procedures (including SE maintenance and support planning) documentation;
- Calibration requirements documentation, including who will provide support and test equipment maintenance and calibration support for the life cycle of the project; and
- Electronics Equipment Information System (EEIS) documentation and Electronics Installation Record (EIR).

5. Manpower and Personnel

(a) Concept

Identify and describe any supporting analyses, crewing studies, constraints or other administrative or mission considerations for determining the system manning/crewing concept and requirements. Identify the type and quantity of personnel required to safely and effectively operate, maintain and support the system. Provide an initial estimate of manpower and workload requirements. If applicable, identify the type and quantity of billets/personnel that will transition from the system/equipment being replaced versus new billets/personnel that are required, or any anticipated manpower savings to be achieved.

(b) Element Detail Planning

Identify and briefly describe the detailed manpower and personnel planning documentation that will be used to support the project. Note that these details are not part of the ILSP, but will be provided separately. Identify what details will be provided, who will provide them and when, who will approve them, who will review them, who will update them for the life cycle of the project, how often the documentation will be reviewed, and how this information will be distributed. The following list is not all inclusive, but should be considered in providing manpower and personnel element details, as appropriate.

- Manpower requirements study, crewing study or staffing standards analysis report per Staffing Standards Manual, COMDTINST M5312.11A (Series).
- Baseline comparison system analysis results.
- Required ship, shore or squadron/unit manning document change summaries.
- Personnel Supportability requirements summary.
- Other documented planning requirements per Naval Engineering Manual, COMDTINST M9000.6 (Series), Provisioning Manual, COMDTINST M4423.2 S), Air Operations Manual, COMDTINST M3710.1 (Series), Aeronautical Engineering Maintenance Management Manual COMDTINST M13020.1 (Series), Electronic Manual, COMDTINST M10550.25 (Series) etc.

6. Packaging, Handling, Storage and Transportation

(a) Concept

Identify and describe the supporting analyses, design considerations, constraints and methods used to determine Packaging, Handling, Storage and Transportation (PHS&T) requirements. Identify the resources, processes, and procedures to ensure that all system, equipment and support items are preserved, packaged, handled and transported properly. Include any applicable constraints (such as reusable containers, Electro-Static Discharge/Electro-Magnetic Interference (ESD/EMI) requirements) identified at this time. Include any applicable environmental considerations, hazardous material identification, equipment preservation requirements for short and long term storage, and transportability requirements. Reference any documentation that contains prescribed guidelines for packaging, handling, storage and transportation of support items. Identify whether standard containers will be used or if special purpose containers are being procured. If reusable containers are to be used, identify what activity is responsible for storing them when not in use.

(b) Element Detail Planning

Identify and briefly describe the detailed PHS&T planning documentation that will be used to support the project. Note that these details are not part of the ILSP, but will be provided separately. Identify what details will be provided, who will provide them and when, who will approve them, who will review them, update them for the life cycle of the project, how often the documentation will be reviewed, and how this information will be distributed. The following list is not all inclusive, but should be considered in providing PHS&T element details, as appropriate.

- Standard procedures document for transportation modes by equipment type.
- Storage considerations, to include environmental constraints and shelf life information.
- Special packaging, handling, storage and transportation requirements summaries (including requirements for reusable containers and cases).
- Summaries of security marking, possible deterioration, electrostatic discharge, and other considerations for transport, handling and storage of electronic items.
- Weight, cube, overall dimensions and special shape summaries for large, heavy items requiring special handling procedures and equipment.

- Other documented planning requirements per Transportation of Freight: Hazardous Material (HAZMAT) Code of Federal Regulations 49CFR Part 100-177; and environmental considerations of 40 CFR Parts 1-800, COMDTINST M4610.5.

7. Facilities

(a) Concept

Identify and briefly describe the process conducted to determine and develop requirements for the permanent, semi-permanent, or temporary real property assets required to support the system. Include any studies, needs analyses, or site surveys conducted to define facilities or facility improvements, construction requirements, locations, space needs, utilities, environmental requirements or considerations, real estate requirements, and equipment requirements for the system being acquired. Identify any constraints or special facilities requirements. Address only areas which pertain to the particular platform or system being supported, as applicable. Briefly describe the types of support facilities required for the system being acquired. If any required facilities will not be completed and available for use when the first production item is fielded, identify how long the facilities will not be available and any interim measures that are planned.

(b) Element Detail Planning

The sponsor's representative and project office should coordinate with the Office of Civil Engineering (G-SEC) early in the acquisition process concerning facilities requirements. Identify and briefly describe the detailed facilities planning documentation that will be used to support the project. Note that these details are not part of the ILSP, but will be provided separately. Identify what details will be provided, who will provide them and when, who will approve them, who will review them, update them for the life cycle of the project, how often the documentation will be reviewed, and how this information will be distributed. The following list is not all inclusive, but should be considered in providing facilities element details, as appropriate.

- Shore and afloat (or embarked) personnel berthing area requirements summary.
- Hangar, ramp (including aircraft tiedown requirements), taxiway and runway facilities.
- Facilities connections requirements summary (including service requirements for sewage, fuel, grey water, bilge water, potable water, telephone, electrical, fuel dispensing, compressed air, air conditioning, heat, etc.).

- Mooring devices, fendering system, and deck fitting requirements summary.
- Shore-side support services summary (including lighting, parking, refuse removal, hazardous waste disposal, fire protection, and Morale, Welfare and Recreation (MWR)).
- Work space and storage facilities requirements summary (including hazardous material and waste storage) and any special requirements for electrical power, compressed air, etc within these facilities.

8. Computer Resources Support

(a) Concept

Identify sub-systems, which have embedded software/firmware. For these embedded computer resources identify and describe the facilities, hardware, system software, software development and support tools, documentation, and personnel needed to support these systems. Identify any supporting analysis or studies for determining the computer resource support requirements. Include any constraints or special considerations identified at this time. Identify the activity assigned responsibility for managing the software and any changes thereto after the system/equipment is fielded. Identify any interim support, warranty, or other special support to be provided. Identify the requirements included in the contract concerning Rights in Data. On an exception basis, identify any software application or software segment for which the government will have less than full data rights. Specifically identify all instances where the government will have limited data rights, and identify what rights will and will not be owned. Specifically identify any software which is proprietary. In each instance where the government will have less than full data rights, specific planning actions being taken for life cycle support must be identified under Element Detail Planning (next paragraph). For software acquisitions, maintenance planning and other support activities may be discussed under the respective ILS elements. Anything involving computer resources support that is discussed under another logistics element need not be repeated in this section of the ILSP, but appropriate cross references need to be provided.

(b) Element Detail Planning

Identify and briefly describe the detailed computer resources support planning documentation that will be used to support the project. Note that these details are not part of the ILSP, but will be provided separately. Identify what details will be provided, who will provide them and when, who will approve them, who will review them, update them for the life cycle of the project, how often the documentation will be reviewed, and how this information will be distributed. Identify who will provide life cycle support for updating/maintaining system software. Identify if system software code is being procured or if the software will be procured as "version controlled". The following list is not all inclusive, but should be considered in providing computer resources support element details, as appropriate.

- Compliance with Coast Guard's Enterprise IT Architecture.
- Computer Resources Life Cycle Management Plan.
- Software Development Plan.
- Software schedule.
- Software management organization and responsibilities index.
- Documentation required by Executive Order 12845, Requiring Agencies to Purchase Energy Efficient Computer Equipment.

9. Technical Data

(a) Concept

Identify and briefly describe the requirements for scientific or technical information recorded in any form or medium (such as manuals and drawings, provisioning technical data, software documentation, etc.) to support the system, and the format (electronic or hard copy) in which the information is to be provided, and the activity that is to develop and provide the information. Also identify who is responsible for approving technical data, the approval procedure, and who will maintain the data for the life cycle of the project. Specifically identify what, if any, participation by using activities is included. Each item of technical data should be enumerated. Computer programs and related software are not considered technical data; documentation of computer programs and related software are. Identify all software documentation to be delivered. Also excluded under this element are financial data or other information related to contract administration. If a performance type specification is used in the contract, all detailed system/segment specifications that are to be developed should be identified. Identify the types of Technical Manuals (TMs) and drawings required to support the system or equipment installed aboard the vessel, aircraft or ashore, and whether these will be developed as part of the design effort or will consist of only contractor manuals primarily for CANDI items. Identify whether TMs will be provided prior to or concurrently with the delivery of first production article. For any TMs not delivered by the time of first production article delivery, identify specific interim measures for overcoming this lack of data. Will preliminary TMs be available for use during Operational Test and Evaluation? Identify how, and by whom, TMs will be validated and verified prior to final publication.

(b) Element Detail Planning

Identify and briefly describe the detailed technical data planning documentation that will be used to support the project. Note that these details are not part of the ILSP, but will be provided separately. However, the ILSP should identify what details will be provided, who will provide them and when, who will approve them, who will review them, update them for the life cycle of the project, how often the documentation will be reviewed, and how this information will be distributed. The following list is not all inclusive, but should be considered in providing technical data element details, as appropriate.

- Technical Manual Contract Requirements (TMCR) document or Technical Manual Requirements summary.
- Engineering drawing requirements listing, summary or other documented requirements required by the Naval Engineering Manual, COMDTINST M9000.6 (Series), the Coast Guard Enterprise IT Architecture, or other documents that are applicable.

10. Design Interface

(a) Concept

Identify the specific ways in which the ILS community will be involved in the design of the equipment. This should include participation in design and program reviews. Identify how system/equipment supportability will be addressed during these reviews. Identify any planning for reliability and/or maintainability demonstrations. Describe how the results of supportability analyses (reference Section A.4 of this plan) will be used to ensure supportability is considered during system/equipment design. Identify any unique support or design philosophies likely to affect support after fielding (for example: planned technological upgrades or extensive integration of CANDI components into a system). Describe how these factors influence detailed maintenance and logistics element requirements planning and development. Reference other project acquisition documents that contain support related design parameters (for example: AP, PORD, ORD).

(b) Element Detail Planning

Identify and briefly describe the detailed design interface planning documentation that will be used to support the project. Note that these details are not part of the ILSP, but will be provided separately. Identify what details will be provided, who will provide them and when, who will approve them, who will review them, provide any necessary life cycle updates how often the documentation will be reviewed, and how this information will be distributed. The following list is not all inclusive, but should be considered in providing design interface element details, as appropriate.

- Reliability/Maintainability/Availability analyses results.
- Reliability Centered Maintenance (RCM) analysis results.
- FMECA results.
- LORA and other appropriate LSA task results, summaries and related LSAR output reports or the equivalent products.
- Human engineering requirements summary.
- Coast Guard Authorized Use List parameters for "environmentally preferable" materials and alternatives.
- System Safety analysis results
- Results of environmental analyses and constraints imposed.

Section D. Other Program Support

1. Human Systems Interface

Identify any human systems interface guidelines and constraints that are applicable to the project and any resultant impacts (positive or negative) on supportability. Briefly discuss any human factors engineering requirements established to:

- develop effective human-machine interfaces,
- minimize or eliminate system characteristics that require extensive cognitive, physical, or sensory skills; require excessive training or workload for intensive tasks; or result in frequent or critical errors or safety/health hazards.
- Support download and analysis of vessel/aircraft data recorders for mishap analysis. Commonality with existing download facility hardware/software should be maintained, whenever possible.

2. Configuration Management

Discuss how Configuration Management (CM) is exercised. Identify when the Configuration Control Board Charter was signed. Identify who has responsibility for Configuration Management for the life cycle of the project. Has any authority to approve configuration changes been delegated, and to whom? Identify any constraints on this delegated authority. When, how, and to whom will CM responsibility be transitioned for sustainment? Identify if there is to be any sharing of CM responsibility, and how it is to be shared.

- Identify the design reviews and configuration audits that are to be conducted and when each is to occur.

- Summarize how logistics support will be addressed in the configuration management/configuration control process. This section of the ILSP should address how the ILS community maintains awareness of the system/equipment configuration and proposed/implemented configuration changes, and how the logistics support impact of changes (i.e., impacts to provisioning data, technical manuals, etc.) is identified and considered.

3. Test and Evaluation

Identify how the ILS community will participate in, or review the results of both Development Test and Evaluation (DT&E) and Operational Test and Evaluation (OT&E). What support requirements/parameters will be evaluated during OT&E. Are operation and maintenance technical manuals evaluated for adequacy and suitability during OT&E? The specific things to be discussed in this section of the ILSP must be tailored to the individual acquisition project and the applicable logistics support requirements that are identified.

4. Miscellaneous

Identify any other related program support requirements affecting the logistics effort, such as metrication, system safety, pollution prevention and environmental hazard control/management, human engineering, etc., as appropriate (Refer to the Related Disciplines section later in this chapter for additional information). Identify any agreements (MOAs and MOUs) that have been established between the Coast Guard and Other Government Agencies (OGAs), their purpose and dates of effectivity (e.g., DoD, GSA). Identify any other negotiated plans that may affect system supportability.

Section E. Milestones

1. Logistic Milestone Events

Identify the major logistics milestones planned to be achieved during the next acquisition phase. Identify all actions/tasks that must be completed in order to achieve each milestone with a planned/actual start and completion date. Identify any interdependencies between each task and any other tasks. This information should be developed in coordination with the project sponsor, the support program manager, the activities responsible for accomplishing the specific tasks, and the ILSMT.

2. Logistic Milestone Charts

The use of Gantt charts, milestone schedules or relational milestone charts, such as those discussed in Enclosure (1), is encouraged to show logistic milestone events (see Enclosure 1, Figure 1-B). Narrative tables may also be used, with planned dates indicated in parentheses. The dating scheme shown in Table 4-5 of this chapter should be used for narrative tables or annotated milestone charts. Identify whether ILS Milestone information is being tracked with a Project Master Schedule. If a Project Master Schedule is being used, indicate the frequency with which the ILS milestone information is being updated. A copy of the ILS portion of the Master Schedule may be appended to the ILSP to satisfy the requirements of this paragraph. The latest updated information must be included just prior to submitting the ILSP for approval and signature.

ILS Milestones

1. CONCEPT & TECHNOLOGY DEVELOPMENT PHASE

a. ILS PLANNING

- Designate ILS Manager
- Establish ILSMT
- Determine all ILS element contractual requirements
- Identify ILS funding requirements
- Prepare initial ILSP
- Provide ILS input to acquisition strategy/plan
- Provide ILS input to TEMP

b. DESIGN INTERFACE

- Identify Reliability, Availability, and Maintainability (RAM) factors to be used in determining support requirements
- Trade-off analysis for support alternatives
- Identify possible human engineering requirements

c. MAINTENANCE PLANNING

- Establish maintenance concept

d. SUPPLY SUPPORT

- Establish supply support concept
- Establish support system requirements and supportability plans

e. PACKAGING, HANDLING, STORAGE AND TRANSPORTATION

- Identify preliminary Packaging, Handling, Storage and Transportation (PHS&T) requirement (if available) including HAZMAT and environmental

f. COMPUTER RESOURCES SUPPORT

- Review and develop initial H/W and S/W requirements
- Select S/W support agency
- Define computer resources security requirements

g. SUPPORT EQUIPMENT

- Identify possible new or changes to support equipment

h. TECHNICAL DATA

- Develop and document technical manual requirements
- Identify engineering drawing requirements

i. FACILITIES

- Identify facility requirements and alternatives

- Conduct and document site surveys, if required
- Identify budget requirements for facilities or facility improvements

j. MANPOWER AND PERSONNEL

- Initiate manpower studies and analyses

k. TRAINING AND TRAINING SUPPORT

- Identify possible new training requirements
- Develop plan for follow-on/pipeline training

2. SYSTEM DEVELOPMENT & DEMONSTRATION PHASE

a. ILS PLANNING

- Update the ILSP
- Conduct ILSMT Meetings
- Review, update, identify any new ILS element contract requirements
- Update ILS funding requirements
- Update ILS input to TEMP
- Conduct initial fielding analysis

b. DESIGN INTERFACE

- Update support requirements if RAM factors change
- Participate in design reviews
- Develop human engineering requirements
- Implement R&M program

c. MAINTENANCE PLANNING

- Refine maintenance concept
- Perform LORA
- Develop preliminary maintenance plans
- Initiate PMS development
- Develop MSOs/MSGs

d. SUPPLY SUPPORT

- Develop supply support concept
- Update support system requirements and supportability plans
- Conduct Provisioning Guidance Conference
- Order provisioned items
- Formalize MSD and CGSD
- Develop interim support plan

e. PACKAGING, HANDLING, STORAGE AND TRANSPORTATION

- Continue to refine PHS&T requirements

f. COMPUTER RESOURCES SUPPORT

- Update H/W and S/W requirements
- Design, develop, test, and implement S/W
- Review, audit, and approve S/W
- Obtain Standard Image Certification, if applicable
- Obtain CIO approval for compliance with Coast Guard Enterprise IT Architecture

g. SUPPORT EQUIPMENT

- Finalize/Verify Support Equipment (SE) requirements
- Add SE to allowance and requirements lists
- Initiate SE procurement

h. TECHNICAL DATA

- Continue to develop and document tech data requirements
- Perform desk top review and verify tech data

i. FACILITIES

- Update facility requirements and alternatives
- Finalize site survey documentation
- Refine budget requirements for facilities or facility improvements
- Acquire facilities

j. MANPOWER AND PERSONNEL

- Update manpower studies and requirements

k. TRAINING AND TRAINING SUPPORT

- Update training requirements
- Develop training plan/MTL
- Review training materials and procure training equipment

3. PRODUCTION & DEPLOYMENT PHASE

a. ILS PLANNING

- Update the ILSP
- Conduct ILSMT Meetings
- Update ILS funding requirements
- Hand-off logistics support system to facility manager/platform manager/sustainment support manager
- Transition to operational support
- Develop ILS input for Project Termination Plan (PTP)
- Update contractual requirements
- Post-production support analysis

b. DESIGN INTERFACE

- Evaluate human engineering procedures
- Evaluate change proposals for ILS impacts
- Continue to monitor and evaluate R&M program

c. MAINTENANCE PLANNING

- Refine maintenance concept
- Verify MSG
- Finalize preliminary maintenance plans/requirements
- Revise PMS requirements

d. SUPPLY SUPPORT

- Finalize Interim support plan
- Produce Allowance Parts List (APL)
- Produce Allowance Equipage List (AEL)
- Produce General Use Consumables List (GUCL)
- Stage/fit out spares

e. PACKAGING, HANDLING, STORAGE AND TRANSPORTATION

- Refine PHS&T requirements

f. COMPUTER RESOURCES SUPPORT

- Transfer H/W and S/W support to operational fleet S/W support activity

g. SUPPORT EQUIPMENT

- Update SE requirements
- Procure SE

h. TECHNICAL DATA

- Continue update of tech data
- Procure tech data as required

i. FACILITIES

- Complete facilities construction/modifications

j. MANPOWER AND PERSONNEL

- Continue to evaluate manpower and personnel requirements

k. TRAINING AND TRAINING SUPPORT

Provide initial training

- Turn over training materials to Coast Guard schools
- Begin pipeline training
- Update training plan/MTL

e. Configuration Management Planning

(1) Purpose

This section establishes the requirements, processes and procedures for Configuration Management (CM) planning and implementation. This section also discusses the preparation, review and approval of a project specific Configuration Control Board (CCB) Charter.

(2) Background

Configuration Management is the means by which the integrity and continuity of the design, engineering, and cost trade-off decisions made between technical performance, producibility, safe operability, testability and supportability are recorded, communicated and controlled for the life of an item. CM, applied over the life cycle of a system/equipment item, provides visibility and control of its functional and physical characteristics. It also verifies that the system/equipment performs as intended, and is identified and documented in sufficient detail to support its projected life cycle. Configuration Management is absolutely essential to establishing and maintaining the right logistics resources to provide effective support for the system/equipment during its operational life. The CM process facilitates orderly management of system/equipment information and those configuration changes approved to revise capability; improve performance, reliability, or maintainability; extend life span; reduce cost; reduce risk and liability; or correct defects.

An effective CM effort should be tailored from a set of guidelines and standards to fit the nature of the project. Commandant (G-SLP) formulates Coast Guard CM policy for platforms (vessels and aircraft), systems, equipment and facilities. Table 4-21 lists the directives, which identify and establish mandatory CM requirements for the acquisition and sustainment life cycle phases.

CM Related Directives	
COMDTINST 4130.6 (Series)	Coast Guard Configuration Management
COMDTINST M4130.8 (Series)	Coast Guard Configuration Management for Acquisitions and Major Modifications
COMDTINST M4130.10 (Series)	Coast Guard Configuration Control Boards
COMDTINST M4130.9 (Series)	Coast Guard Configuration Management During Sustainment
COMDTINST M13020.1 (Series)	Aeronautical Engineering Maintenance Management Manual
COMDTINST M9000.6 (Series)	Naval Engineering Manual
CGTO PG-85-00-70	Aircraft Configuration Control Board Process Guide
COMDTINST M4130.9 (Series)	Coast Guard Configuration Management During Sustainment

Table 4-21, CM Related Directives

Additional information concerning CM and the CM process can be obtained from ISO 10007 (International Standard 10007), Quality management – Guidelines for configuration management, published by the International Standards Office; ANSI/EIA-649, National Consensus Standard for Configuration Management, published by the Electronic Industries Alliance; and MIL-HDBK-61A, Configuration Management Guidance.

(3) Configuration Management Concepts

Configuration Management is an integral part of acquisition requirements and project management for both hardware and software systems. A system's configuration represents its functional (performance) and physical (form and fit) characteristics. These characteristics are described in technical documentation, assessed and approved/verified in technical reviews and configuration audits, and achieved in the manufactured and accepted product. CM processes span all acquisition phase(s) and are driven more by project technical and CM events rather than acquisition phases. CM can be initiated by inputs from the systems engineering process as early as the Concept and Technology Development phase and continues throughout the life cycle as the system develops and is modified. Configuration changes occur throughout the life of the system as more knowledge of the system design, operation and maintenance concepts is gained; and mission requirements change. These configuration changes must be controlled to ensure that they are first cost effective, necessary and safe, and second that they are properly documented so that all producers, users, and support personnel are aware of the current configuration status.

(a) Configuration Management Objectives

The following CM objectives are incorporated in business planning, project planning, execution, and support.

- Identify and document the functional and physical characteristics of selected system components designated as configuration items, during the life cycle. Product attributes are defined, product configuration is documented and a known basis for making configuration changes is established, and products are labeled and correlated with their associated requirements, design and product information.

- Control changes to configuration items and their related technical documentation. Proposed configuration changes are identified and evaluated for impact prior to making change decisions. Configuration change activity is managed using a defined process.

- Record and report information needed to manage configuration items effectively, including the status of proposed configuration changes and implementation status of approved configuration changes. Configuration information captured during the product definition, configuration change management, product build, distribution/deployment, operation and sustainment, and disposal processes is organized for retrieval of key information and relationships, as needed.

- Ensure that the complex aggregate of configuration items meets the system specified and operational requirements. Actual product configuration is verified against the required attributes. Incorporation of configuration changes is verified and recorded throughout the product life.

(b) Configuration Items

A Configuration Item (CI) is an aggregation of hardware, software, or both; or any of its discrete portions, which:

- satisfies an end-use function,
- is either maintenance worthy or engineering/logistics critical, and
- is designated for CM and treated as a single entity in the CM process.

Unique support items, that are maintenance worthy, are also designated as configuration items. A hardware configuration item (HWCI) is comprised of physical material, such as a cutter/boat or aircraft, computers and peripherals, or other end item system/equipment, and the subsystems and components/parts of which they are comprised. A computer software configuration item (CSCI) is comprised of a software component, or an aggregation of software such as an operating system or application. Firmware is a combination of hardware items and software (normally programmable computer chips with resident, read-only memory that can only be changed in a laboratory environment or with the use of special purpose computer tools), which is installed in a hardware component and is treated as an HWCI.

(4) Elements of Configuration Management

The CM process uses four elements, directly correlating to the CM objectives. These elements are illustrated in Figure 4-11, and discussed in the following subparagraphs.

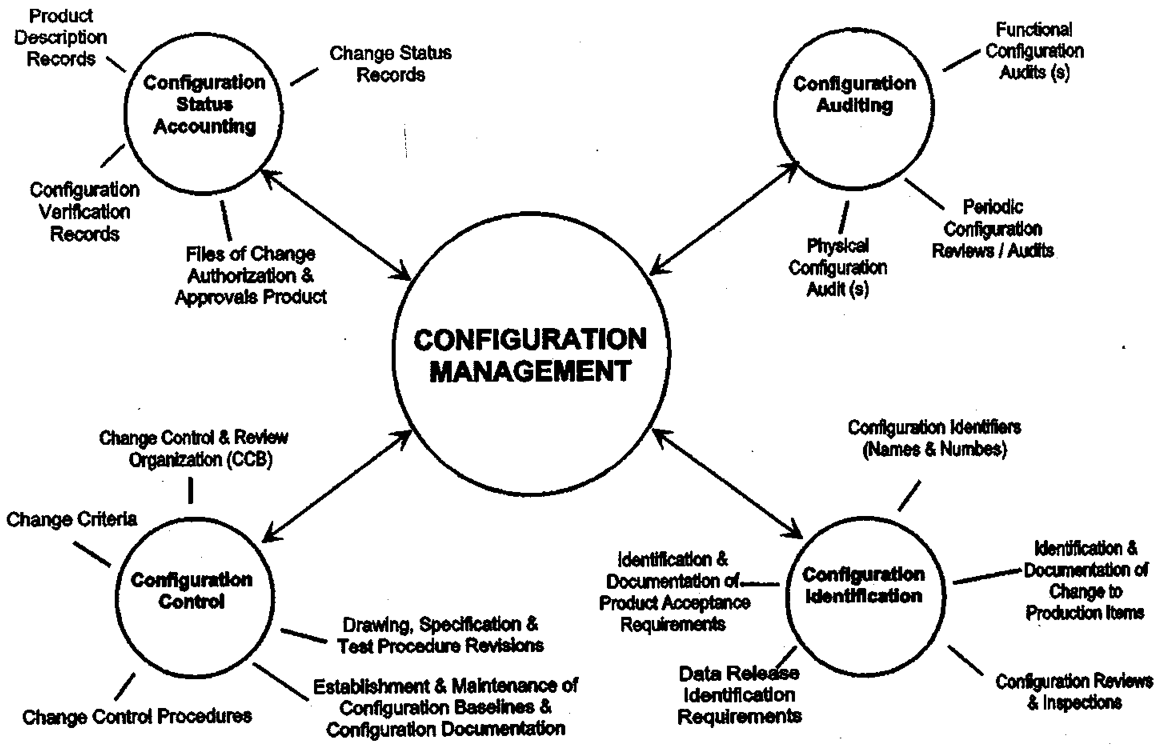


Figure 4-11, Configuration Management Elements

(a) Configuration Identification

The purpose of configuration identification is to incrementally establish and maintain a definitive basis, i.e., configuration baseline(s) and the supporting documented technical description that collectively define a CI. Performed correctly, configuration identification provides all acquisition project and operations management disciplines with common reference points for the material end item and its CIs. Configuration identification leads to the approved release of the items and their associated technical documentation for design, development, production and operational activities. Configuration baselines are established after the PM and project matrix personnel review, and the PM approves, configuration identification documentation and other technical data for the items. Configuration Management involves three configuration baselines, which may be established at any point in a project where it is necessary to define a formal departure for control of future changes in mission performance, design, and logistics support. Baselines are founded on approved and/or verified configuration documentation. All documentation proposed for review and baseline approval by the Coast Guard must be successfully completed prior to submitting it for formal design reviews and audits.

The three configuration baselines that are established during the acquisition project are the Functional, Allocated and Product Baselines. The configuration identification for each configuration item becomes progressively more detailed as system design or selection and later testing progress, and with the establishment of each successive baseline. There is an associated Functional, Allocated, and Product Configuration Documentation for each of the formal baselines. To be effective the functional, allocated, and product configuration documentation must be mutually consistent and compatible. When a discrepancy arises between or among the levels of documentation for a configuration item, the precedence is first Functional, second Allocated, and third Product. Acquisition projects should ensure that the absence of any of these types of configuration documentation are noted and justified. For software applications that are developed incrementally, a separate series of baselines need to be established for each increment/module. The timing of when these individual baselines will follow the same sequential identification for each increment/module, but may not correspond to the standard acquisition phasing and Key Decision Points.

1. Functional Baseline

The Functional Baseline (FBL) is the initially approved baseline for a system. The FBL is defined by its Functional Configuration Documentation (FCD). The FCD is written as a system specification or a prime item specification for a single item development project. The FCD documents the performance requirements for a system or subsystem. The FCD identifies system requirements and describes the system's functional, interoperability and interface characteristics, and design constraints, such as envelope dimensions and logistics parameters. It also identifies any requirements for use of a specific type or standard architecture (e.g., C4ISR Architecture Framework mandated by the CIO in COMDTNOTE 3090 dated 4 August 2000). The functional characteristics include quantitative performance, operating and support parameters, such as range, speed, reliability, maintainability and safety. The FCD should include configuration documentation for items being separately developed or currently in the Coast Guard supply inventory, with which the system will interface or be integrated. Other project documents such as the MNS and ORD reflect the system specification, and therefore are part of the FCD along with the technical requirements and guidance package which governs and controls system engineering and design efforts. The formal FBL is established after successful completion of a Systems Requirements Review (SRR) late in the Concept and Technology Development Phase; completion of preliminary design during the System Development and Demonstration Phase; and successful completion of a System Design Review (SDR) in the late System Development and Demonstration Phase or at the time the FCD is approved by the Coast Guard or implemented under the contract. Formal configuration control begins with the establishment of the approved FBL.

2. Allocated Baseline

The Allocated Baseline (ABL) is defined by the approved Allocated Configuration Documentation (ACD). The ABL identifies and the ACD defines and documents the breakout of the requirements in the FCD into more detailed functional requirements for the system and major subsystems. An ABL documents the performance requirements plus testing results for systems and lower level CIs. These performance specifications define the particular performance requirements for each individual CI, and are developed and approved during the System Development and Demonstration Phase. The specification, when approved, documents the ABL for a CI and provides the basis for detailed design and development of that CI. Formal ABLs are established after completion of contract design, and whenever possible, award of the engineering contract. The ABLs for HWCIs are normally established at their Preliminary Design Reviews (PDRs), but no later than the Critical Design Reviews (CDRs). The ABLs for CSCIs are normally established during, or immediately following, their Software Specification Reviews (SSRs). The ACD includes the definition of functional characteristics for CIs, tests and test results demonstrating achievement of allocated functional requirements, interface requirements with other CIs, and design constraints such as component standardization, use of inventory items and ILS requirements. The ACD also includes the approved performance or development specifications and the technical requirements and guidance package governing system design activities. Whenever possible, the ABL is formally established with the award of the engineering contract.

3. Product Baseline

The Product Baseline (PBL) is the approved technical documentation that defines the identity, part number, and configuration of each CI during the Production and Deployment Phase, and is defined by the Product Configuration Documentation (PCD). The PCD represents the approved and complete or "built to" documentation of the product specification. The PCD includes all engineering drawings, test requirements and results, performance verification data, and other technical documentation. The PCD describes all of the necessary functional and physical characteristics of the CI designated for production acceptance testing and reflects the logistics support requirements and procurement strategies detailed in the contract. The PCD defines the final stage of system development at a level of detail sufficient to implement operational, support and reprocurement strategies. The PCD includes the engineering drawings and detailed design documentation of the product technical package. Successful completion of the PDRs, the CDRs, and both Functional and Physical Configuration Audits (FCAs/PCAs) is required for each CI prior to approval and acceptance of the PCD and establishment of the PBL. The formal PBL should be established after a PCA is performed towards the end of the System Development and Demonstration Phase or early in the Production and Deployment Phase. The PBL and PCD for each CI should be established and verified prior to product acceptance by the Coast Guard.

(b) Configuration Control

Configuration control is the systematic proposal, justification, evaluation, coordination, approval or disapproval of proposed changes, and the implementation of all approved changes, in the configuration of a CI after establishment of the configuration baseline(s) for the CI. Formal configuration control is initiated with the approval of the system or prime item specifications/documents and the formal establishment of the functional baseline (FBL) for a CI. The Configuration Control Board (CCB) is the most important agent for configuration change review and approval, and is responsible for reviewing and issuing changes to the configuration baseline. Once the FBL has been established, any proposed change to form, fit, function, safety, or the logistics support of a CI, must be considered by the CCB. Within the contractor's organization, CM functions are normally assigned to a Configuration Manager (CMan). The contractor may also have an internal CCB with responsibility for screening proposed configuration changes prior to Government review and processing. The purpose of this control is to provide a thorough evaluation of proposed configuration changes and to provide continuous traceability and status of a proposed configuration change from initiation to implementation or rejection. In addition, configuration control continues to ensure that various project efforts are dealing with or referring to the same item.

Strict configuration change control measures during the early development of a CI can ensure adequate control of the developing, and later the fielded product. The term configuration change signifies the configuration of the functional or physical characteristics of a CI (hardware, software, or firmware) has been, or will be changed. A proposed configuration change may be submitted as a/an:

1. Engineering Change Proposal

An Engineering Change Proposal (ECP) identifies a proposed configuration change that, when approved, makes a permanent change to a configuration baseline, and all of the documentation pertaining to that baseline must be changed in addition to incorporating the configuration change on the system. A configuration change incorporated by an ECP may, or may not, be applicable to all of the systems that are procured. The effectivity of the configuration change must also be documented in the configuration baseline documentation.

2. Request For Deviation

A Request For Deviation (RFD) requests approval to deviate from a baseline configuration for a specified period of time or for a specified quantity of production systems. (NOTE: An RFD includes what was previously known as a Request for Waiver. With the cancellation of MIL-STD-973 and publication of MIL-HDBK-61A, Request for Waiver has been deleted from the CM lexicon.) An approved deviation does not result in a change to the baseline documentation. However, when a deviation is approved, it results in the configuration of a certain number of production items not conforming to the baseline configuration, and authorizes the delivery of these non-conforming systems. This non-conforming configuration becomes a permanent condition for the affected items and must be documented. An ECP must be approved, subsequently, if the non-conforming items are to be returned to standard baseline configuration. An RFD is never applicable to software applications.

3. Specification Change Notice (SCN)

A Specification Change Notice is a document used to propose, transmit, and record changes to a specification.

4. Notice Of Revision (NOR).

A Notice of Revision is used to define revisions to configuration documentation, which require revision after ECP approval.

Information concerning each of these types of configuration change documents is provided in Coast Guard Configuration Management for Acquisitions and Major Modifications, COMDTINST M4130.8 and MIL-HDBK-61A.

(c) Configuration Status Accounting

Configuration Status Accounting (CSA) systems record and report the information needed to manage configuration items effectively. CSA begins when the first configuration baseline, the FBL, is formally established and approved/accepted by the Coast Guard. Consistent CM data must be made available to all organizations in the project matrix to ensure all project personnel are working from a common reference point. Automated CSA systems and databases are preferred, and should be contractually required and maintained. The contractor's CSA system must facilitate transfer of data and be compatible with the Coast Guard data systems. Configuration based data, including technical information, should be recorded and maintained as a single integrated database of information for acquiring and supporting equipment and platforms. Information about the configuration should be collected during the development of the project requirements documentation and continue to be used and maintained throughout the asset's life cycle. CSA includes the following data objectives:

- Serve as the record of Government approved configuration items, identification numbers and supporting technical documentation.
- Provide the processing status of proposed configuration change proposals, deviations and waivers.
- Provide the implementation status of approved configuration changes.
- Provide the current configuration data (what is it, how is it identified, where is it used) of all configuration items in the operational inventory. (This is not to be confused with inventory or item management, rather it deals with design release and management.)

(d) Configuration Audits

Configuration audits validate and verify that system design and development requirements are achieved and that CIs and their identification are accurate, complete, and satisfy the approved requirements. Audits are conducted on each unique CI or group of functionally related CIs. Normally, audits are conducted after the PDR and CDR. Configuration is identified and verified by comparing the CI with its technical documentation (e.g., drawings, specifications, interface control documents, and other contract requirements). Configuration audits are prerequisites to establishing the PBL of each item. Two kinds of audits are performed: Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA). In addition, periodic in-process audits can be conducted to monitor the progress of the contractor.

1. Functional Configuration Audit

The Functional Configuration Audit (FCA) is the formal examination of the functional characteristics of a CI prior to system acceptance. The FCA process normally involves auditing qualification test results to verify that the CI's actual performance complies with the performance requirements and design constraints as set forth in the contract and specification. The FCA should be performed on a prototype or pre-production system. The FCA should precede the PCA because the product configuration identification can change as a result of FCA action items.

The Project Configuration Manager (CMan) should ensure the latest approved or conditionally approved documentation is provided for the FCA. The Project CMan also:

- Establishes the FCA agenda
- Identifies the FCA team
- Selects what CIs should be audited, and
- Chairs or co-chairs the FCA with the contractor's CMan.

At a minimum, the following should be reviewed during the FCA:

- Test plans, procedures and the test results listed in test reports.
- Engineering drawing list, including revision level.
- Drawings of provisioned spare parts. These drawings should be selectively sampled to assure essential manufacturing test data are furnished with the drawings.
- Technical manual operating procedures.

2. Physical Configuration Audit

The Physical Configuration Audit (PCA) is the formal evaluation of the "as built" configuration of a CI, or group of like CIs, against its technical documentation. The PCA process includes detailed audits of engineering drawings, specifications, approved engineering changes, and other manufacturing data used to produce the CI(s). Production systems, logistics support, and reprocurement depend on the results of the PCA. The actual configuration of the system/equipment item must match the configuration information in the documentation and any difference discovered during the audit must be corrected. The PCA should be conducted on the first production article. The PBL is approved, and the PCD is established upon successful completion of the PCA.

Part of PCA planning should include information about individual CIs and groups CIs to be audited. This information should include: nomenclature, specification identification numbers, CI identifiers, serial numbers, part/drawing numbers, and CSCI identification and version numbers. The following should be reviewed during the PCA:

- The approved ACD, including the HWCI specification or CSCI software requirements, and all approved configuration changes, deviations, and waivers.
- Design differences between the PCA system being audited and the FCA system that was audited.
- Final draft of the HWCI(s) and/or CSCI(s) product specification.

- A comparison of the actual deliverable hardware against all approved drawings.
- Sample manufacturing instruction sheets to ensure they accurately reflect design details contained in the engineering drawings.
- The contractor's engineering release system and configuration change control procedures to establish its effectiveness and use.
- System acceptance test results and procedures for adequacy and compliance with the product specification performance requirements.
- Final version of computer software operating and support documents for traceability to the final software code.

3. Periodic Audits

Periodic audits of the contractor's CM system may be conducted by the Project CMan. These audits must be specified in the contract. Periodic audits can ensure that the contractor's CM system is in compliance with the contractor's CM requirements levied in the contract and is satisfactorily identifying and documenting the configuration of the system being procured.

(5) Configuration Management Planning Considerations for Commercial and Non-Developmental Items

Commercial and Non-Developmental Items (CANDI) from Government or commercial sources, a widely used acquisition consideration for the Coast Guard, used in direct support of an operational or mission requirement shall be designated as a CI and can require special acquisition configuration management consideration and planning. Generally, these items should not be modified in order to avoid creating unique Government items, support requirements, and costs. CANDI may have limited or no technical data, technical data may be considered proprietary, and/or constrained maintenance or support concepts, which require constrained or augmented planning. CANDI software may require the procurement of licenses (may be a recurring requirement) for use or procurement of data rights (either limited or full). CANDI items, which are embedded in a developmental system, must be clearly identified so that configuration management risks and planning can be realistically assessed. CANDI items from other government agencies or departments (such as DoD) may also have a proprietary CM responsibility and requirements that must be considered in planning Coast Guard CM procedures. Market surveys and active participation in vendor/customer or other agency supplier/user communications and feedback may be required to address Coast Guard CM in these cases.

(6) Roles and Responsibilities

COMDTINST M4130.8 and COMDTINST M4130.10 provide additional guidance concerning CM responsibilities, procedures and requirements during the systems acquisition process.

(a) Project Manager

The Project Manager (PM) is responsible for the overall conduct of CM and technical data management for the acquisition project. PM responsibilities include the following.

- Draft the Configuration Control Board (CCB) charter after approval of the PORD, but not later than KDP 2. Convene and chair the acquisition project CCB. As CCB Chairperson, receive CCB recommendations on the disposition of requested configuration change proposals, and approve/disapprove all configuration change proposals within his/her authority, as established in the CCB Charter.
- In the event of his/her absence, ensure that the Deputy Project Manager is appropriately delegated/designated to act as the CCB Chairperson.
- Ensure that CM concerns and considerations are addressed and incorporated in other acquisition project activities and documentation, as appropriate.
- Ensure that CM issues and actions are appropriately communicated to contractor CM organizations.

(b) Configuration Manager

The project Configuration Manager (CMan) is a member of the PM's dedicated staff and is responsible for the day-to-day coordination of CM activities. For small projects, the Technical Manager or Logistics Manager may be designated as the CMan. The CMan shall be responsible for the following.

- Serving as the CCB recorder, coordinator and status control point for all configuration change proposals.
- Receiving all ECPs, route to appropriate members of the CCB, and consolidate comments and recommendations for the CCB Chairperson.
- Preparing and distributing CCB meeting agenda to all CCB members informing them of the date, time and place of meetings.
- Maintaining a tracking system for all approved or disapproved configuration change information, proposals, requests for deviations and waivers, CCB activities and dispositions, and completed alterations.
- Establishing and maintaining all configuration control procedures, history and processing information for each submitted configuration change proposal or request.

- Reviewing project documentation and develop applicable CM inputs to ensure that CM requirements are adequately addressed.
- Coordinating, attending, and/or participating in applicable project technical reviews and configuration audits.

(c) Configuration Control Board

The CCB is the action arm of the CM organization and is responsible for thoroughly evaluating and recommending appropriate disposition of proposed configuration changes and requests for deviations to system baselines. The acquisition project CCB is established by Commandant (G-CCS) charter after acceptance of the Preliminary Operational Requirements Document (PORD), but no later than KDP2. If a proposed configuration change affects an item that is currently in the Coast Guard or DoD inventory, the acquisition project PM will not have CM authority for the item. The PM may need to coordinate acquisition project configuration control with other internal and external Coast Guard CCBs, such as those established for Coast Guard aircraft or cutters, or for DoD managed systems and equipment. The acquisition project CCB is chaired by the PM as designated in the project's CCB Charter. In the absence of the PM, the Deputy PM will be appropriately designated by the PM as the alternate CCB Chairperson. In addition to the CCB Chairperson and dedicated PM's staff members, the CCB is composed of all operating and support Program Managers or their representatives, who support the acquisition or operation and maintenance of the system. Functional area representatives on the CCB include the sponsor's representative, engineering support, contracting support, logistics management and policy, spares provisioning, training, personnel, safety, electronics support, and legal support. The project CCB Charter will define the responsibilities of the CCB. The CCB's main functions include the following:

- Review, recommend for approval or disapproval, and refer to a higher authority, as appropriate, all configuration changes and proposed alterations that will modify a system's functional characteristics or operational requirements.
- Monitor the CM process by working with the PM and project CMan to ensure the system configuration remains in agreement with the approved configuration baseline(s) and documentation; the CSA database is current; and configuration control is being exercised effectively.
- Review configuration change proposals and requests for deviations and waivers to ensure that they are consistent with the operational requirements and that they are properly analyzed and documented.
- Monitor implementation of approved configuration changes.

(d) Facility Manager or Program Manager

CM responsibility is transferred to the appropriate Facility Manager or Program Manager at the hand-off of the acquired system. The acquisition Project Manager is responsible for configuration control of the system, while it is in production. As the Contractor delivers finished products to the Government, the sponsor's representative or facility manager takes charge of configuration control. Transfer of full CM responsibility is normally accomplished after the last production asset is delivered, not later than project termination. Operational CM is an ongoing effort critical to maintaining effective operational support and readiness. The Facility Manager or Program Manager should be involved as early as possible with project CM efforts in order to facilitate the transition from acquisition project to operational program. If appropriate, CM responsibility may be shared between the Project Manager and the Facility/Program Manager at some point after production delivery systems are fielded. If this happens, the specific responsibilities and authority of both the Project Manager and the Facility/Program Manager must be clearly delineated.

(7) Configuration Control Board Charter Preparation and Approval

The PM is responsible for the preparation of the CCB charter, assisted by the project CMan. The CCB charter will be prepared in the Concept and Technology Development Phase, after acceptance of the PORD, but not later than KDP 2. The CCB charter shall be in accordance with Exhibit 4-6 and COMDINST M4130.10. A matrix-level concurrent clearance review of the CCB charter shall be conducted, in accordance with the procedures in Chapter 6. After resolution of matrix concerns, the CCB charter is submitted for approval. However, if matrix-level review results in a non-concur response, receipt of substantive comments, or a significant change to the CCB charter, a CGARC-Level Concurrent Clearance may be required. The PM will provide the document package to the CGARC Executive Secretary recommending whether the document should be routed for CGARC concurrent clearance. Following all required clearances, the CCB charter is submitted by the PM, endorsed by Commandant (G-A), and approved by the Chief of Staff, Commandant (G-CCS).

(8) Configuration Management Plan

There is no requirement for a major acquisition project to develop a separate CM Plan document. However, the PM must establish the appropriate tailored CM organization to implement proper configuration management. Exhibit 4-7 identifies CM requirements that the PM for each major acquisition shall follow in establishing and conducting a CM program. These requirements shall be used as a generic CM plan by each major acquisition project. The requirements shall be tailored, as appropriate, to fit the specific acquisition project. Tailored requirements shall be identified in the enclosure to the Project CCB Charter, as shown in Exhibit 4-6.

Sample Configuration Control Board Charter

U.S. Department of Transportation
United States Coast Guard

Memorandum

Subject: **(PROJECT NAME)** CONFIGURATION CONTROL BOARD CHARTER

Date: **XX XXX XX**
4130

From: Chief of Staff

Reply to Attn. of: **G-XXX**
PM'S POC
267-XXXX

To: Distribution

Ref: (a) Coast Guard Configuration Management, COMDTINST 4130.6 (Series)
(b) Major Systems Acquisition Manual, COMDTINST M4150.2 (Series)
(c) Coast Guard Configuration Management For Acquisitions and Major Modifications, COMDTINST M4130.8 (Series)
(d) Coast Guard Configuration Control Boards, COMDTINST M4130.10 (Series)

1. **Purpose.** To publish the charter by which the Configuration Control Board (CCB) for the **(Project Name)** will function as required by references (a) through (d). This designation is effective immediately and shall remain in effect until modified or canceled.

2. **Background**. The **(Project Name)** CCB shall provide technical and administrative direction and oversight to identify and document functional and physical characteristics of the **(Project Name)**, control changes to those characteristics, and report/record change processing and implementation.

3. **Charter**.

a. **Scope**. The **(Project Name)** CCB is the decision making authority for baseline approval, final review, and disposition of all Class I (affecting safety, form, fit, function, or logistics support structure) Engineering Change Proposals (except changes affecting Mission Need Statement and Operational Requirements Documents) and all critical and major deviations. The **(Project Name)** CCB applies only to the **(Project Name)**. The **(Project Name)** Project Manager (PM) shall establish and conduct a configuration management (CM) program in accordance with the requirements outlined in Chapter 4 and Exhibit 4-7 of reference (b), tailored as identified in enclosure (1), the **(Project Name)** Configuration Control Procedures.

b. **Background**. A CCB is critical to the **(Project Name)** acquisition to provide an orderly process for the review of potential changes, which can have a significant impact to the **(Project Name)** in terms of cost, schedule, and performance. The CCB serves as the capstone to the configuration control process, and ensures that only necessary changes are instituted.

XX XXX XX
4130

Subj: **(PROJECT NAME)** CONFIGURATION CONTROL BOARD CHARTER

c. **(Project Name) CCB Membership**. The CCB shall consist of **(but not limited to)**:

FUNCTIONAL AREA	RESPONSIBILITY
Project Manager	Chairperson
Deputy Project Manager	Permanent Member
Sponsor Representative	Permanent Member
Engineering (HM&E and Electronics, Aviation, or other as applicable)	Permanent Member
Platform/Support Manager	Permanent Member
Contracting Support	Permanent Member
Safety, Security, and Environmental Health	Permanent Member
Logistics Policy	Permanent Member
Training and Performance Consulting	Permanent Member
Configuration Manager	Recorder
Legal	Ad Hoc Member
Acquisition Technical Support	Ad Hoc Member
ELC/ARSC/C2CEN (as appropriate)	Ad Hoc Member

The respective organizational entities shall empower their CCB members to make configuration management decisions and recommendations that will become binding upon their organizations.

d. **Authority.** The CCB Chairperson is hereby granted the authority to approve/disapprove configuration changes. Since the **(Project Name)** is a Coast Guard major acquisition, the CCB Chairperson shall refer any proposed configuration changes affecting the **(Project Name)** Operational Requirements Document (ORD) or Mission Need Statement (MNS) to higher authority per reference (b). In the absence of the PM, the Deputy PM will be appropriately designated by the PM as the alternate CCB Chairperson.

2

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4130

Subj: **(PROJECT NAME)** CONFIGURATION CONTROL BOARD CHARTER

4. **Duties and Responsibilities.** The CCB shall carry out the duties and responsibilities identified in references (a) and (b). The main CCB function is to ensure the **(Project Name)** addresses, as appropriate, all aspects of configuration management in accordance with reference (a).

5. **Action.** Offices represented on the **(Project Name)** CCB shall designate one primary and one alternate representative. The designation shall be provided in writing to the **(Project Name)** PM no later than 30 days after this charter's effective date. All designated **(Project Name)** CCB members shall comply with this charter.

Encl: (1) **(Project Name)** Configuration Control Procedures

Dist: **(Include, at a minimum, all CCB members, permanent and ad hoc.)**

3

Sample Configuration Control Board Charter Enclosure

(Project Name) Configuration Control Procedures

(1) Delegation of Authority

Authority to approve Class II ECPs and minor deviations for the **(Project Name)** project **(will/will not)** be delegated **(to what activity, if delegated)**.

(2) CCB Meetings

Regularly scheduled **(Project Name)** CCB meetings will be conducted **(frequency of scheduled meetings)**. Emergency CCB meetings may be conducted on short notice, if required. If there are no proposed configuration changes to be reviewed at a scheduled CCB meeting, the meeting shall be canceled by the **(project)** PM.

(3) CCB Meeting Agenda

An agenda for each scheduled **(Project Name)** CCB meeting shall be provided to all CCB members at least a week prior to the meeting. A copy of each proposed configuration change that is to be reviewed at the CCB meeting shall be provided with the agenda to facilitate review prior to the meeting.

(4) CCB Meeting Minutes

Formal minutes for each **(Project Name)** CCB meeting shall be provided to each CCB member within **(number)** days after the meeting for review. Final minutes shall be provided to each CCB member within **(number)** days after each meeting. The meeting minutes shall document the action taken by the CCB Chair for each proposed configuration that is reviewed during the meeting and the concurrence/non-concurrence of each permanent CCB member.

(5) Permanent Record of Actions

The **(Project Name)** PM shall maintain a copy of each set of **(Project Name)** CCB meeting minutes and a copy of each proposed configuration change as a permanent record of the action taken and concurrence/non-concurrence of each permanent CCB member. A copy of each proposed configuration change approved/disapproved under delegated authority shall also be maintained as a permanent record. Permanent records shall be maintained **(where)**.

(6) Contractual CM Requirements

The **(Project Name)** PM, with the assistance of the **(Project Name)** CCB members and other matrix support team members, shall ensure that all applicable requirements for CM related tasks and the associated delivery of required data products are included in the Request For Proposal and Contract documents.

(7) Transition of CCB Chair Responsibility

The **(Project Name)** CCB Chair responsibility shall be transitioned to **(what activity) (when)**. **(If applicable, provide details of any sharing of CCB Chair responsibility.)**

Enclosure (1)

Configuration Management Requirements

For Major Acquisition Projects

This Exhibit contains the requirements for organizing and conducting a Configuration Management program that shall be followed by each major acquisition project. These requirements shall be tailored by the PM to fit the specific acquisition project, as necessary. Where alternatives are identified, the alternative that is selected shall be identified in the enclosure to the CCB Charter, as shown in Exhibit 4-6.

1. Organizing for Configuration Management

a. Internal Project CM Organization

Responsibility for CM during acquisition of a system is vested in the Acquisition Project Manager (PM). However, the authority for accomplishing many CM related activities needs to be delegated to other people. The PM shall establish a CM organization that is tailored to the specific acquisition project requirements and ensure that all delegated authority is specifically identified.

- The Deputy PM shall be delegated the authority to act for the PM in the PM's absence, with any constraints on this authority specifically delineated.
- The PM shall identify a Configuration Manager to administer the CM program for the project. The Configuration Manager should be a member of the acquisition project staff. For large, complex acquisitions, a separate billet may be identified as the Configuration Manager. For smaller, less complex acquisitions, or when constrained due to lack of billet structure, the Technical Manager or Integrated Logistics Support Manager may be assigned collateral duties as the Configuration Manager at the PM's discretion. Assignment of Configuration Manager responsibility shall be identified in the enclosure to the CCB Charter.
- All project staff members and matrix support personnel (both Coast Guard Headquarters offices and subordinate activities, as applicable) shall be kept fully involved as members of the project's CM organization. Additionally, (as applicable) the Project Resident Office (PRO) and/or the Contracting Officer's Technical Representative (COTR) shall be kept fully involved as members of the CM organization. Any CM authority delegated to the PRO Commander or COTR shall be specifically delineated, to include any constraints that must be observed.
- The Procuring Contracting Officer (PCO) and (when applicable) the Administrative Contracting Officer (ACO) are critical members of the CM organization and shall be responsible for issuing any guidance or instructions pertaining to CM that is provided to the contractor.

b. External Project CM Organization

The primary CM organization external to the acquisition project is the prime contractor's CM organization. The interface between the Coast Guard and contractor's CM organizations shall be delineated in the RFP and contract. Additionally, information concerning the contractor's CM organization and existing CM policies shall be obtained. This shall be done in one of the following ways:

- The PM shall consider including a requirement in the RFP for the contractor's CM organization and CM processes to be identified as part of the proposal that is submitted to the Coast Guard for evaluation. If this requirement is included, the PM shall establish evaluation criteria for the proposed organization and processes in Section M of the RFP.
- Alternatively, the PM shall include the requirement for identifying the contractor's CM organization and CM processes as a contract deliverable for review and comment/approval after contract award.

The PM shall also determine if there are any other external CM organizations with which the project CM organization must interface. This shall include any required interface with other contractors/vendors and any other government agency CM organizations. This shall be project specific. The following shall be taken into consideration:

- Are any items being purchased directly from a vendor by the Coast Guard or other Government Agency and supplied to the contractor as GFE?
- What common equipment items (items used in other systems/equipment) are being used for which configuration management authority/responsibility is already assigned?

2. Configuration Identification and Control

The configuration of the system being acquired shall be identified and controlled in progressively greater detail through the establishment and documentation of Functional, Allocated and Product configuration baselines. The establishment of the Functional Configuration Baseline, consisting of the system functional requirements as identified in the Mission Need Statement, Operational Requirements Document and the Contract Specification shall be the starting point for configuration control. The allocated baseline shall be established after initial design of the system has allocated the required system functions to appropriate subsystems or modules. The product baseline shall be established after the first production representative system has been audited and the "as-built" configuration of the system has been verified to match the detailed design and construction documentation (i.e., detailed drawings and other detailed product technical package documentation). Any change to an established baseline shall be processed and approved as a configuration change and all corresponding changes to the system configuration documentation shall be accomplished.

3. Management of Configuration Changes

a. Types of Configuration Changes

A change in system configuration during acquisition is normally the result of the approval of either an Engineering Change Proposal (ECP) or a Request For Deviation (RFD).

(1) Engineering Change Proposal

There are two classes of ECP, Class I and Class II. The ECP classification is determined by the significance and impact of the configuration change being proposed.

(a) Class I Engineering Change Proposal

A proposed configuration change shall be considered a Class I ECP if it affects the functional or allocated configuration baseline, makes a significant change to the product configuration baseline, impacts safety or logistics support, or results in a contractual change to cost, guarantees/warranties, deliverables, or scheduled contract milestones.

(b) Class II Engineering Change Proposal

A proposed configuration change shall be considered a Class II ECP if only minor changes to the product baseline and its documentation result, there is no functional or physical interchangeability impact, the proposed change is within the scope of the contract, or it only addresses editorial corrections to functional and allocated configuration baseline documentation, and it has no significant impact which would make it a Class I change.

A more complete definition of what constitutes a Class I and Class II ECP is contained in Coast Guard Configuration Management for Acquisitions and Major Modifications, COMDTINST M4130.8 (Series) and Configuration Management Guidance, MIL-HDBK-61A.

(2) Request For Deviation

Requests for Deviation are classified as Critical, Major or Minor based on the impact severity of the deviation from baseline or required configuration.

(a) Critical Deviation

A critical deviation is one that impacts safety or involves a departure from a requirement that is considered critical.

(b) Major Deviation

A major deviation is one which impacts health, performance, interchangeability, reliability, survivability, maintainability, or durability of the item or its repair parts; effective use or operation; weight; significant change in appearance (form); or involves a departure from a requirement that is classified as major.

(c) Minor Deviation

A minor deviation is one that does not rise to the level of either a major or critical.

b. Review and Approval/Disapproval of Proposed Configuration Changes

The Configuration Control Board (CCB) Charter establishes the CCB as the advisory board to review proposed configuration changes (both ECPs and RFDs) and recommend either approval or disapproval. The PM is identified as the CCB Chair and tasked with the responsibility for approval or disapproval of these proposed configuration changes within certain constraints. These constraints include:

- Approval of any configuration change which requires a change to the Mission Need Statement (MNS) or Operational Requirements Document (ORD) shall be held in abeyance until Commandant (G-CV) approves the MNS/ORD change.
- Any proposed change to a configuration item for which another activity/agency has CM authority and responsibility shall be coordinated with that activity/agency prior to being approved.

Approval/disapproval authority for Class I ECPs and Critical/Major RFDs is retained by the CCB Chair. The PM shall not delegate this authority to anyone except the Deputy PM who functions as the CCB Chair in the PM's absence. Approval/disapproval of Class II ECPs and Minor RFDs may, at the discretion of the PM be delegated, as follows:

- For acquisition projects which have a PRO constituted, the PRO Commander may be delegated the authority to approve/disapprove Class II ECPs and Minor RFDs. For acquisition projects that do not have a PRO constituted, the Contracting Officers Technical Representative (COTR) may be delegated the authority to approve them. In either case, the authority shall be delegated, in writing, with any/all constraints on this authority specifically identified. For example: the strict definition of a Class II ECP requires that it have no impact on cost or schedule. However, it is fairly common practice for the PRO Commander for a cutter acquisition project to be delegated the authority to approve ECPs with a "minor" cost or schedule impact as Class II ECPs. The definition of what constitutes "minor" cost or schedule impact and is allowable under Class II criteria shall be determined by the PM and included as specific constraints to the delegated authority.
- In some cases, particularly under a performance-based contract, the PM may elect to delegate approval authority for Class II ECPs and Minor Deviations to the contractor.

It is critical to have the specific constraints and boundaries on what is acceptable to include in these categories identified within the contractual agreement.

The PM shall identify in the enclosure to the project CCB charter whether or not approval authority for Class II ECPs and minor deviations is delegated, and to whom it is delegated.

c. Priorities for Processing Configuration Changes

The allowable time period for reviewing and taking action in response to a proposed configuration change is predicated on the severity or criticality of the impact of the proposed change if not approved and implemented. However, the concept of "taking action" does not necessarily mean final approval or disapproval.

(1) Emergency Engineering Change Proposals

Emergency ECPs, by definition, propose a configuration change to alleviate a perceived condition, which is very severe. These proposed configuration changes shall be evaluated and some action taken by the next duty day after receipt. This does not necessarily mean the proposed change must have final approval or disapproval rendered. However, some action shall be taken to preclude the occurrence of the condition that is identified on an interim basis until a complete review and final action can be taken. Final approval/disapproval action shall be taken as expeditiously as possible after evaluating all of the applicable information concerning the proposed configuration change and taking any required collateral action.

(2) Urgent Engineering Change Proposals

Urgent action ECPs shall be evaluated and some action taken as soon as possible within 30 days of receipt. Again, this does not necessarily mean final approval/disapproval must be taken within 30 days. However, the ECP shall have an initial evaluation completed and either be approved, disapproved, or deferred for a specific reason. The urgency of the conditions that may be experienced if the ECP is not approved shall be evaluated and any appropriate action taken during the initial evaluation, at a minimum. Again, final approval/disapproval action shall be taken as expeditiously as possible after evaluating all of the applicable information concerning the proposed configuration change and taking any required collateral action.

(3) Routine Engineering Change Proposals

Routine ECPs (both Class I and Class II) shall be evaluated as expeditiously as possible, but within 90 days, at maximum. If initial evaluation discloses a need for additional action or collateral action prior to final approval or disapproval, it shall be deferred as an initial action and final action taken at a later date. The initial evaluation shall include consideration of any time sensitive parameters pertinent to having a final approval/disapproval decision rendered.

(4) Major/Critical Request For Deviations

Requests for major and critical deviations require careful evaluation to determine the full impact that would be realized if approved. All possible alternatives to approving a major or critical deviation shall be thoroughly investigated, even to the point of delaying production, delivery, or acceptance of the end item(s) involved. Approval or disapproval action shall be taken within 30 days of receipt unless additional information or clarification is requested. If a major or critical deviation is approved, appropriate action shall also be taken to mitigate or preclude the affects of the deviation, and a correction of the deviating condition shall subsequently be addressed with an ECP, if at all possible.

(5) Minor Request For Deviations

Requests for minor deviations shall be evaluated to ensure they are in fact minor and do not have any associated impacts that would preclude acceptance as a minor deviation. These shall be approved or disapproved by the appropriate authority within 15 days of receipt unless some aspect of the proposed deviation requires additional clarification or information. Approval or disapproval shall be rendered as soon as the additional information is made available. Requests for major and critical deviations shall not be approved unless some extraordinary circumstance makes them essential.

RFDs shall not be submitted or approved on a recurring basis. An RFD shall not encompass the entire quantity of systems/equipment being procured. Any deviation that would affect all of the items being procured shall be addressed through a change in requirements since the requirement pertinent to the requested deviation would be voided by approval of the deviation. RFDs are never applicable to software development.

d. Submittal of Proposed Configuration Changes

Anyone may submit a proposed configuration change to a system. A configuration change proposal submitted by someone other than the prime contractor shall be submitted to the acquisition project office, and evaluated by the CCB. If the proposed configuration change is deemed worthy of being pursued, the Contracting Officer shall provide the contractor a formal request for an ECP to fully identify all the costs and impacts of the change, if accomplished.

Proposed configuration changes (ECPs or RFDs) submitted by the prime contractor shall be submitted in accordance with the applicable contract provisions, in the format specified by the applicable CDRL item. If a PRO has been constituted for the acquisition project, the contractor shall submit the proposed change to the PRO for initial evaluation. If the proposed configuration change is a Class II ECP or minor RFD, and approval authority has been delegated, the PRO shall take the appropriate action to approve or disapprove it. If the proposed configuration change is a Class I ECP or major/critical RFD, or no approval authority has been delegated, the proposed change shall be submitted to the acquisition project office in accordance with the applicable contract provision, in the format specified by the applicable CDRL item, for approval or disapproval by the CCB.

4. Configuration Control Board Meetings

a. Configuration Control Board Meeting Frequency

CCB meetings shall be held on a regularly scheduled basis to ensure prompt review and action on any proposed configuration changes. The frequency of these meetings is up to the discretion of the PM and should be dictated by the number of proposed configuration changes that are received. As a general rule, a CCB meeting should be scheduled on at least a quarterly basis. A monthly scheduled meeting is highly recommended for most complex projects. A semi-annual meeting may be adequate for some software projects. If there are no proposed configuration changes to evaluate, the scheduled CCB meeting shall then be canceled by the PM. The frequency of scheduled CCB meetings shall be identified in the enclosure to the CCB charter.

b. Configuration Control Board Meeting Procedures

All proposed configuration changes (ECPs and RFDs) shall be reviewed by the CCB membership. If approval authority for Class II ECPs and minor deviations has been delegated, a copy of each approved and disapproved configuration change shall be reviewed by the CCB membership on an after-the-fact basis for information. All Class I ECPs and major/critical deviation requests shall be forwarded for review by the CCB membership and approval/disapproval by the CCB Chair.

The following procedures for conducting CCB meetings shall be followed:

- An agenda for each CCB meeting shall be provided to each CCB member at least a week prior to the meeting. The agenda shall identify each proposed configuration change that is to be acted upon or reviewed at the meeting. A copy of each proposed configuration change shall be forwarded with the agenda to allow the members to evaluate and establish a corporate position. Any change to the agenda shall be disseminated to the CCB membership by the most expeditious means possible.
- The PM shall formally document each voting CCB member's concurrence or non-concurrence with each configuration change that is evaluated using the CCB Directive (or an appropriate variation, thereof) shown as Exhibit 4-8. Each permanent CCB member in attendance at the meeting shall annotate the CCB Directive to indicate approval or disapproval, the date, and enter his/her initials in the spaces provided. The CCB Directive identifying these concurrences/non-concurrences shall be made a part of the formal approval/disapproval record for each proposed configuration change. In the case of a non-concurrence, the dissenting member may attach a formal written dissent to the CCB Directive. The dissenting CCB member shall annotate the CCB Directive to indicate whether a written dissent is to be attached.
- The action taken by the CCB Chair shall also be documented on the CCB Directive (Exhibit 4-8) for each proposed configuration change. This may include approval, disapproval, hold in abeyance for a specific reason (i.e., MNS or ORD change required, or additional information required), or forwarding to another agency having configuration management authority. Additionally, the actions that are to be taken by

any other activity shall be specifically delineated on the CCB Directive as a matter of record. The completed CCB Directive shall be maintained as a permanent record with the proposed configuration change to which it pertains.

- The Project Configuration Manager shall publish formal minutes of each CCB meeting within two weeks after the meeting is conducted. The minutes shall specifically identify each configuration change reviewed at the meeting, the specific action taken by the CCB Chair, any non-concurrence or dissenting appeal that is made, and any actions directed. The minutes shall also reflect each configuration change that is approved/disapproved by a delegated authority. CCB minutes shall be maintained as permanent records in the project files.

5. Configuration Audits

a. Functional Configuration Audit

The PM shall conduct a Functional Configuration Audit (FCA) on a pre-production or prototype system (if possible) to verify that the "as built" system conforms to the Functional and Allocated Configuration Baseline documentation. If not possible to be conducted on a pre-production or prototype system, the FCA shall be conducted on the first production representative system. Any discrepancies between the "as-built" configuration and the Functional or Allocated Baseline documentation shall be resolved.

b. Physical Configuration Audit

The PM shall conduct a Physical Configuration Audit (PCA) on the first production representative system to verify that the "as built" system conforms to the Product Configuration Baseline documentation. A 100 percent audit may be conducted, or a representative sample audit may be conducted at the discretion of the PM, but the results of the audit shall provide an accurate reflection of how well the actual configuration and the configuration documentation match. Any discrepancies between the "as-built" configuration and the Product Baseline documentation shall be resolved.

c. Configuration Audit of Software

The PM shall establish an Independent Verification and Validation (IV&V) procedure to audit the software code for developmental software applications and ensure the developed software matches the software configuration documentation. Any discrepancies between the software and the configuration documentation shall be resolved.

Exhibit 4-8

PROJECT TITLE CCB DIRECTIVE

PM Routing Symbol:	ECP Submitted by:	Contract:

ECP Title:	Priority:	Type:	Number:

Production Effectivity:	Retrofit Effectivity:	Kits Required:

PRO Recommendation: Date Received:

☐ Approve ☐ Disapprove ☐ Memo Attached

CCB Member Recommendations:

Permanent CCB Members	Approve	Disapprove	Memo Attached	Date	Initial

CCB Chair Action:

☐ Approved

☐ Conditional Approval Pending:

- ☐ Revision to MNS ☐ Revision to ORD
- ☐ Formal ECP Submittal
- ☐ Approval by Agency having Configuration Authority

☐ Deferred Reason: ____

☐ Disapproved

Direction:

☐ KO Prepare Approval Letter

☐ KO Prepare Disapproval Letter

☐ ECP to be prepared by: ______________________________

☐ Forward to: ______________________ (Agency having Configuration Authority)

☐ Defer to CCB Meeting of: __________________ (Date)

Comments: ____

CCB Chair Signature: ______________________ Date: ______________

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f. Project Termination Planning

(1) Purpose

This section describes project termination planning and establishes the requirements and procedures for the preparation, review and approval of the Project Termination Plan (PTP).

(2) Background

The Project Manager, having overall responsibility for the conduct of a major acquisition project, needs to plan the termination and closeout of the project office as the acquisition nears its close. The PM accomplishes this planning by documenting the termination activities and events in a PTP.

(3) Definitions

The following terms are defined as their use applies to acquisition project management and project termination.

(a) Termination Period

The time period from when project management focus goes from production to deployment/implementation of the system. This period begins with system/equipment hand-off(s) and ends with the closeout of the Project Office, the Project Resident Office (PRO) if applicable, or contract administration completion.

(b) Hand-off

The date a system/equipment is transferred to the Operating Program Manager (OPM)/Facility Manager. The OPM/Facility Manager assumes custody and responsibility for the delivered, ready for operations system/equipment.

(c) Closeout

The date(s) established in the PTP, on which the Project Office and/or the PRO are disestablished or contract administration completed. On the Project Closeout Date all offices are disestablished and the Operating Program Manager and/or the Facility Manager assumes full responsibility for operations and support of the system/equipment acquired.

(4) Discussion

The termination period is a critical point for the project. The PM and the OPM/Facility Manager/Support Program Manager must cooperate with each other to accomplish successful project closure. Project tasks are coming to a close; the PM may have departed or is preparing to depart; and confusion may exist over who is responsible for the remaining project tasks. The PTP provides the basis for direction and control of technical and business aspects for completing the project. In addition to communicating the closeout of a project in the PTP, it is also advisable to have a mechanism for project review. With an approved PTP, the PM, or the PM's successor, has the approved direction to finish any remaining project tasks and to prevent these tasks from "falling through the cracks."

(5) Roles and Responsibilities

(a) Project Manager

The Project Manager (PM) is responsible for coordinating all of the project's termination tasks. The PM plans and documents the termination activities, remaining tasking and responsibilities, and the timing of events required to complete the project in a PTP. Plans must be developed, by the PM, for determining the disposition of the project management files, i.e., archiving, disposal, etc.

(b) Operating Program Manager

On the hand-off date for each system/equipment, the Operating Program Manager (OPM)/Facility Manager will assume the custody of and responsibility for the operational system. The OPM/Facility Manager will assume responsibility for maintaining the system configuration and become the Chair of the Configuration Control Board on a date agreed upon by both the PM and the OPM/Facility Manager.

(c) Commandant (G-S)

The affiliated Offices and Staffs in the Systems Directorate must be engaged to ensure the appropriate levels of responsibility for the maintenance and logistic support of system(s) handed-off are adequately addressed. The responsibility for maintaining and supporting the Integrated Logistics Support Plan (ILSP), prepared by the PM during the production phase, will be transferred to the appropriate Platform Manager/Support Program Manager prior to termination of the acquisition project. The applicable Platform Manager/Support Program Manager is responsible for preparing subordinate Equipment ILSP (EILSP) and/or Equipment Support Summary (ESS) documents to implement the ILSP planning prior to introduction of the first production unit into operations. The Platform Manager/Support Program Manager, as applicable, will become the chair of the Integrated Logistics Support Management Team during sustainment.

attention are the Contracting Officer's (KO) files, materials that are not standard sizes, provisioning technical data, and whether or not contract drawings are to be included.

3. Warranty

Following the departure of the PRO's KO, Commandant (G-ACS) will administer the remaining portion of the contract warranty period.

4. Outstanding Contracts

Commandant (G-ACS) will administer any support contracts for the project upon the dissolution of the project staff.

5. Closeout Procedures

Commandant (G-ACS) will provide instructions and guidance to the PM and PRO in order to prepare for contract closeout.

(6) Procedures

(a) Preparation

- The PM shall complete the preparation of a PTP approximately 12 - 18 months prior to the delivery of last unit of the project's production or the planned closeout date. The PM will include the PTP as a task to be completed in the Project Management Plan.
- The PTP shall be prepared in accordance with Exhibit 4-9, which presents a sample PTP Cover Page and Table of Contents, and PTP content requirements.
- The PM should prepare the draft PTP in consultation with all Program and Support Managers involved in the project to insure all remaining tasks are appropriately addressed and assigned. It is recommended that consensus be achieved amongst the project matrix members through a matrix level Concurrent Clearance process.

(b) Review and Approval

A Matrix-level concurrent clearance review shall be conducted in accordance with the procedures in Chapter 6. If matrix-level review results in a non-concur response, receipt of substantive comments, or a significant change to the PTP, a CGARC-level concurrent clearance may be required. After resolution of any matrix concerns, the PM will provide the document package to the CGARC Executive Secretary recommending whether the document should be routed for CGARC concurrent clearance. After resolution of matrix and/or CGARC concerns, the PTP is routed for approval. The PTP is submitted by the PM and approved by Commandant (G-A).

Exhibit 4-9

SAMPLE PROJECT TERMINATION PLAN

Cover Page

Project Termination Plan (PTP)
for the

PROJECT TITLE

Submitted by: ______________________ ____________
Project Manager Date

Approved by: ______________________ ____________
Project Director (G-A) Date

Sample Project Termination Plan

Table of Contents

Sample Project Termination Plan

Content Requirements

1. General

The PTP should focus on what has to be done by whom and when to complete the project. Since each acquisition is unique, the exact content will vary for each project.

2. Contents

Executive Summary

Provide an Executive Summary of the Project Termination Plan. The Executive Summary should be a brief (one or two pages) discussion of the Plan, highlighting the salient points of each section of the Plan. Be sure to include the goals and objectives of the Plan and expected outcomes. Briefly discuss the roles and responsibilities of key participants.

Section A. Project Summary

This section will describe the current status of events affecting the project.

1. Project Status

Describe the current status of the project, i.e. the number of units delivered, the number remaining to be delivered, problems, etc.

2. Assumptions

Describe any assumptions that have been made in preparing the PTP and in preparing to close the project. (e.g., an Integrated Support Center will be available prior to the project close out date or the Operations System Center (OSC Martinsburg) will be prepared to take over the support of an information system.)

3. Risks

Describe any risks associated with the successful completion of the project.

4. Schedule

Provide a schedule for the events required for completing the project. The schedule will identify future remaining tasks, the potential impact of these efforts on the project completion or any other remaining major project milestone dates.

5. Financial Status

State the financial status of the project, including the adequacy of current funding, the disposition of any remaining funds, and the identification of the source of funds necessary to adjudicate any known or anticipated contract claims.

Section B. Documentation

This section will describe the documents that are required to complete the project and assign the responsibility for their preparation and/or update.

1. Integrated Logistic Support Plan

The Integrated Logistic Support Plan (ILSP) will be provided to the OPM/Facility Manager prior to the hand-off of the first operational system. State the date the hand-off occurred, provide additional guidance, and identify any outstanding issues. Any supportability requirements that will not be satisfied prior to project termination must be identified along with the interim support provisions implemented.

2. Configuration Control

The Chair to the Configuration Control Board will be assigned to the OPM/Facility Manager no later than the hand-off date of the last system. This hand-off should be negotiated between the PM and the OPM and should occur at the point when the system design is fixed and no further changes are expected to arise from the acquisition process. When this handoff occurs, all CCB records and the status of any ECPs that are pending or in process should be transferred. State the planned hand-off date; provide any additional guidance; and identify any outstanding issues.

3. Project Manager's Charter

The PM will advise Commandant (G-A-2) when the Chief of Staff's memorandum canceling the PM's Charter is required. This memo should summarize outstanding project tasks and reassign the responsibility for the completion of these tasks. The memo will be coordinated with all affected offices/activities prior to being forwarded for approval and signature.

4. Operating Facility Change Orders

In accordance with Operating Facility Change Orders (OFCO) Procedures, COMDTINST M5440.3, the PM shall prepare the appropriate OFCO(s) for disestablishment of the PRO(s) or contract administration organization. In some situations more than one OFCO may be necessary. State the project's plans for executing any required OFCOs; provide any additional guidance; and identify any outstanding issues. The following issues must be addressed in order to disestablish the PRO or contract administration organization. The disposition of these issues should be specifically defined in the OFCO.

- Temporary Space Requirements
- Morale Funds
- Government Furnished Equipment
- Spare Parts
- Technical Manuals
- Test Equipment
- Tools
- Personal Property
- Information Technology (IT) Equipment
- Classified Material
- PRO Developed Procedures
- Unexpended Funds
- Historical Files

Section C. Contracting Actions

In preparation for closing the PRO or the contract administration organization, remaining contracting responsibilities will need to be addressed. Provide a summary of the outstanding issues for the areas listed below.

- Outstanding Claims
- Records Management
- Warranty
- Outstanding Contracts
- Closeout Procedures

Section D. Project Personnel Phasedown Planning

1. Project Staff Assignments

The PM will state when dedicated staff, dedicated matrix, and if applicable PRO billets/positions can be made available for reprogramming. Additionally, the PM will coordinate transfer and reassignment issues with Commandant (G-A-1) and the Coast Guard Personnel Command (CGPC); provide anticipated dates for the availability of reassignment/disposition of IT equipment; and provide anticipated dates for the reassignment of space within the Headquarters building. If necessary, the PM will address the necessary reassignment of any pending tasks for project completion.

2. Project Resident Office

The PM will describe the planned assignment of Project Resident Office (PRO) or the contract administration organization staff responsibilities, recommend organizations to assume these responsibilities, and indicate when the current individuals are scheduled to transfer.

g. Related Disciplines

(1) System Safety Planning

(a) Purpose

The purpose of system safety planning is to ensure the identification and understanding of all known hazards and their associated risks; and mishap risk is either eliminated or reduced to acceptable levels. The objective of system safety is to achieve acceptable mishap risk through a systematic approach of hazard analysis, risk assessment, and risk management. System safety planning is applicable throughout the life cycle for any system, new development, upgrade, modification, resolution of deficiencies, or technology development. The system safety approach should be documented to describe the approach, identify each hazard analysis and mishap risk assessment process that is used, and identify the risk mitigation alternatives and the expected effectiveness of each alternative.

MIL-STD-882D, Standard Practice for System Safety, provides the primary reference guidance used in developing system safety engineering and management task requirements.

(b) Background

System safety planning is applicable to every activity of the system life cycle; i.e., research, design, test and evaluation, production, construction, checkout/calibration, operation, transportation, storage, maintenance and support, modification, and disposal. The aim is to eliminate hazards or reduce the associated risk to an acceptable level. System safety planning makes sure Safety and Environmental Health (SEH) risk control, consistent with mission requirements, is designed into systems, subsystems, equipment, facilities, their interfaces and operations. Control and management of hazardous materials is an integral task of system safety planning. Occupational Safety and Health Act (OSHA) requirements must also be taken into consideration. The degree of SEH risk reduction achieved depends directly on management emphasis and involvement. The PM must emphasize SHE during the acquisition process making sure SEH risk is understood and SEH risk reduction is always considered. System safety planning should be a coordinated effort by the PM, project staff members, the sponsor, and the Office of Safety and Environmental Health, Commandant (G-WKS).

(c) System Safety Planning Objectives

The principle objective of establishing a system safety program is to make sure safety, consistent with mission requirement, is designed into systems, subsystems, equipment, facilities, and their interfaces and operation. The system safety program should document each accepted residual risk and provide the sponsor and PM the information needed to manage the risks throughout the life cycle of each acquired system. The sponsor should work with G-WKS to identify the personnel safety and environmental considerations required in the ORD. A formal system safety program that stresses early hazard/mishap identification and elimination or reduction of associated risk to a level acceptable to the managing activity is the principal contribution to the success of an acquisition project. The system safety effort depends greatly on definitive statements that clearly outline safety objectives and requirements. Safety objectives include:

- Eliminate hazards through design.
- Isolate hazardous substances, components, and operations from other activities, areas, personnel, and incompatible materials.
- Locate equipment so that access during operations, servicing, repair, or adjustment minimizes personnel exposure to hazards (e.g., hazardous substances, high voltage, electromagnetic radiation, and cutting/puncturing surfaces).
- Minimize risks caused by environmental conditions.
- Design to eliminate or minimize risk caused by human error.
- Consider safety devices that will minimize mishap risk.
- Provide standardized warnings and cautions in operator and maintenance manuals when risks cannot be eliminated.
- Minimize retrofit actions required to improve SEH through timely inclusion of SEH features during development and acquisition of the system.
- Leverage use of mishap recorder information for thorough investigation and development of preventive measures.

(d) System Safety for Commercial and Non-Developmental Items

The procurement of Commercial and Non-Developmental Items (CANDI) equipment or commercial operational support or maintenance of such items poses potential problems. These problems usually result from the fact that the item was built to commercial standards and may not satisfy USCG mission and safety requirements. Review must be given to CANDI procurements to ensure safety considerations are adequately addressed and risks minimized.

(e) Roles and Responsibilities

1. Project Manager

The Project Manager (PM) shall:

- Request the Office of Safety and Environmental Health, Commandant (G-WKS) assign a project safety specialist to manage the project system safety program.
- Establish, plan, organize, implement, and maintain an effective system safety effort that is integrated into all life cycle phases.
- Ensure that system safety planning is documented to provide visibility into how the system safety effort is to be conducted.
- Establish definitive safety requirements for the procurement, development, and sustainment of the system. The requirements should be clearly delineated in the appropriate system specifications and contractual documents.
- Provide historical safety data to developers.
- Monitor the developer's system safety activities and review and approve delivered data in a timely manner to ensure adequate performance and compliance with safety requirements.
- Ensure that the appropriate system specifications are updated to reflect results of analyses, tests, and evaluations.
- Document acceptance of residual mishap risk and associated hazards.
- Keep the system users apprised of system hazards and residual mishap risk.
- Ensure adequate resources are available to support the system safety effort.

2. Project Safety Specialist

The project safety specialist should be involved in all aspects of the acquisition process accomplishing the following tasks:

- Provide guidance, advice, and assistance to the PM concerning safety and environmental health.
- Attend meetings and review of project documents, as appropriate.
- Ensure system safety concepts and tasks are incorporated into the acquisition planning documents and other plans which manage the project over the life cycle.
- Outline system safety requirements into the project's SOW and RFP documentation.
- Perform safety, occupational, and environmental health risk assessments of the Circular of Requirements, critical design submissions, and engineering change proposals, deviations, and waivers.
- Ensure unacceptable safety, occupational health, environmental health, fire, risks are identified, controlled, and documented.

(f) Documentation

System safety program concepts and tasks should be incorporated into the Project Management Plan, Integrated Logistics Support Plan, and Test and Evaluation Master Plan, as appropriate.

(2) Environmental Considerations

(a) Purpose

This section describes the environmental impact analysis (EIA) and planning process, which is followed throughout the acquisition process to ensure that potential effects on the human and global environment are accounted for during the evaluation and selection of the appropriate solution(s) to fulfill mission needs. EIA is conducted for each acquisition to comply with the National Environmental Policy Act. National Environmental Policy Act (NEPA) Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1 (Series) establishes the requirements, processes and procedures for EIA and the preparation, review and approval of environmental documentation. These requirements apply to all major acquisitions except those for software, only. Software, by itself, does not present any environmental impacts that need to be considered.

(b) Background

1. National Environmental Policy Act

The National Environmental Policy Act (NEPA) (42 USC 4321-4370d) mandates that:

- Federal agencies give equal consideration to environmental factors, along with economic costs and operational requirements, in their decision making processes, and
- Federal agencies document their environmental evaluations, in coordination with other recognized government and non-government environmental experts and interested parties.

NEPA does not mandate that the Federal action must be "environmentally correct." The requirements are that an agency must:

- equally consider the potential for environmental effects of its proposed activities at the earliest possible time in the decision-making process;
- identify environmental effects and values in comparable detail to economic and operational analyses;
- assess the potential environmental effects of all reasonable and prudent alternatives that meet the agency's mission needs, including less environmentally harmful alternatives;
- document the manner in which they considered environmental effects; and
- make the environmental document available to public officials and other interested parties before decisions are made.

2. Executive Orders

Executive Orders 12856 (Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements) and 12873 (Federal Acquisition, Recycling and Waste Prevention) require that all Federal agencies implement policies and practices, which emphasize pollution prevention, affirmative procurement and recycling.

(c) Environmental Objectives

The principle objective of establishing environmental system considerations within the USCG is to ensure that each project has thoroughly considered and applied, consistent with mission requirements, the most up-to-date environmental policies while attaining experience (lessons learned) and advice from environmental stakeholders. Environmental objectives provide the sponsor with information about the residual risks and issues to manage and plan for, throughout the life cycle of each project. Environmental objectives should include, but are not limited to, the following:

- minimizing environmental requirements impacting the acquisition,
- enhancing relations with environmental stakeholders,
- complying with environmental requirements prior to production and deployment,
- minimizing compliance costs and procedures during the deployment and operational phases,
- maximizing opportunities to obtain reasonable environmental benefits during the deployment and operational phases,
- facilitating continued operations with lowered risk of disruptions or delays due to environmental compliance matters, and
- minimizing disposal costs at the end of the acquisition life cycle.

(d) Environmental Planning

System design, development, testing, production, support, operation, maintenance and ultimate disposal could all have potentially adverse effects on the environment. Environmental planning and analysis prior to and from the formal start of an acquisition project is critical to minimize any adverse effects at the least cost. Additionally, the timing and coordination of non-Coast Guard environmental interests may be a significant issue; early coordination will minimize project schedule interruptions. The EIA process should be tailored to obtain the most value for the Coast Guard, while meeting the legal mandates and addressing the full life cycle (including disposal) of each viable acquisition alternatives. Organizational efficiencies can be gained through early and systematic consideration and documentation of environmental requirements in the acquisition process, thereby reducing the potential need for numerous site specific analysis and documentation in later phases. Environmental documentation developed during the acquisition process also provides a baseline of information to address public concerns that arise during the deployment and operational phases. Environmental planning includes:

- involving the Environmental Management Division, Commandant (G-SEC-3) in the acquisition team during acquisition planning;
- ensuring the project sponsor is kept fully informed on the progress of the EIA during each phase of the acquisition process;
- anticipating the necessary level of EIA and documentation required;
- programming adequate funds to perform appropriate EIA and complete environmental documentation (anticipate the need for contracted support in this area);
- identifying the likely significant environmental effects as early as possible and ensure that the EIA process focuses on those potentially significant environmental effects throughout the acquisition life cycle;
- identifying appropriate non-Coast Guard environmental interests to be consulted early and begin to anticipate their concerns;
- scheduling sufficient time in the acquisition process for appropriate coordination with non-Coast Guard environmental interests;
- scheduling environmental reviews at the start of each phase of the acquisition to ensure that environmental requirements are being adequately considered and documented in a programmatic manner;
- identifying "environmentally preferred" products, in accordance with Executive Orders 12856 and EO 12873: Federal Acquisition, Recycling and Waste Prevention, to be used in the manufacture, operation and maintenance of the acquisition;
- identifying recycled or recyclable materials for use in the acquisition; and
- developing the acquisition to facilitate the ultimate disposal of the product or equipment in the least costly and most environmentally compliant manner.

(e) Environmental Analysis and Documentation

NEPA requires that Federal agencies document their analysis of the potential for environmental effects from their activities as they are being planned. Discussed below are three levels of environmental analysis and documentation.

1. Categorical Exclusions

Categorical exclusions are agency activities that have been determined, through a history of environmental evaluations, to have little potential for significant environmental effects. Most system acquisitions can not be categorically excluded, since by definition, they are substantially new agency activities. However, some system acquisitions, such as computer hardware replacements, can be categorically excluded from further requirements for NEPA documentation, provided that the analysis determined that there are no limitations precluding the use of the categorical exclusion that require preparation of an environmental assessment.

2. Environmental Assessments

Environmental Assessments (EA) are prepared when either an agency does not have or cannot use a categorical exclusion for a particular activity or the agency is not sure of the potential for environmental effects from its proposed activity. The EA process evaluates the potential for significant environmental effects of the options being considered. The EA process includes coordination with non-USCG environmental interests. If the EA process determines that no significant environmental impacts are likely to occur from the agency's proposed action, then a Finding of No Significant Impact (FONSI) can be prepared. If the EA process identifies the potential for significant environmental impacts, then an Environmental Impact Statement must be prepared. There are also situations where agency management may want to take advantage of the more prescribed public involvement requirements and time limits in an Environmental Impact Statement process when it may not be otherwise required. Many system acquisition projects will likely require the EA level of environmental documentation.

3. Environmental Impact Statements

Environmental Impact Statements (EIS) are required when an agency has identified that its proposed activity(s) are likely to result in significant environmental impacts. The process of preparing an EIS has many stages and phases of documentation that are prescribed by regulation. The EIS process is the most resource and time consuming level of environmental documentation.

(f) Roles and Responsibilities

1. Sponsor

The Sponsor should articulate a concerted effort to establish EIA which will include: pollution prevention practices, compliance with environmental regulations and maintenance requirements as part of the PORD/ORD. The preferred approach to pollution prevention is source reduction. The preferred method of achieving this reduction is substituting less or non-hazardous materials, modifying production processes or operating procedures, redesigning components to reduce hazardous materials (HMs) use, eliminate hazardous waste (HW) generation, and encourage materials and HM recycling and reuse.

2. Project Manager

The PM shall:

- Coordinate with the Environmental Management Division, Commandant (G-SEC-3), in developing the Environmental Impact Analysis.
- Ensure that the specification and Statements of Work require "environmentally preferable" alternatives to hazardous materials wherever feasible and identify possible recycled or recyclable materials for use in the acquisition.
- Ensure that the project Cost Analyses include appropriate economic analysis for all significant environmental effects, including hazardous material alternatives needed for the acquisition's maintenance, operation, subsequent waste disposal, ultimate reuse, recycling and/or disposal.

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(3) Enterprise Information Technology Architecture

(a) Purpose

This section provides a high level overview of the process and products prescribed in the Coast Guard Enterprise Information Technology (IT) Architecture Framework (promulgated by the Coast Guard Chief Information Officer (CIO), Commandant (G-CIT)) for IT systems during the acquisition process.

(b) Background

The Coast Guard Enterprise Information Technology (IT) Architecture provides a set of principles, guidelines, and rules that guide the Coast Guard through acquiring, building, modifying, maintaining, and operating IT resources while meeting governmental responsibilities and mandates. The goal of the Enterprise IT Architecture is to ensure interoperability and information exchange between Coast Guard assets and across Coast Guard missions.

(c) Structure

The architecture is the structure of components, their interrelationships, and the principles and guidelines governing their design and evolution. The Enterprise IT Architecture Framework includes the optimal set of products required to develop system architectures that can be commonly understood and integrated within and across Coast Guard organizational boundaries and external organizations, including the Department of Transportation (DOT), Department of Defense (DoD) and other government agencies.

The Enterprise IT Architecture Framework is comprised of 12 interrelated products that describe the enterprise and application system perspectives for the Coast Guard information technology environment. These products are the:

- Overview and System Summary,
- Integrated Dictionary,
- Technical Architecture Profile,
- Standards and Forecasts,
- Organizational Relationships Chart,
- High Level Functional Concept Diagram,
- Functional Node Connectivity Description,
- Functional Information Exchange Matrix,

- System Interface Description,
- System Communications Description,
- System Evolution Description, and
- System Technology Forecast.

For application systems that are required to comply with the DoD Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Architecture Framework or Federal Enterprise Architecture Framework for interoperability reasons or by external mandate, the applicable products as developed will meet the requirements for the corresponding Enterprise IT Architecture product.

(d) Perspectives

The Coast Guard's Enterprise IT Architecture Framework can be perceived from both the Enterprise and the individual Application System Perspective.

1. Enterprise Perspective

The Enterprise Perspective, an agency-wide view of all Coast Guard information technology systems, is centrally developed and maintained by the CIO and transcends all application systems. Enterprise Perspective is defined by the:

- Overview and System Summary,
- Integrated Dictionary,
- Technical Architecture Profile,
- Standards and Forecasts, and
- Organizational Relationships Chart.

These products provide guidance and context to IT managers and application system developers to achieve compliance with the requirements of the Enterprise IT Architecture. Updates to these products will result from changes in Coast Guard IT strategy and incorporation of new and/or updated application system designs.

2. Application System Perspective

An Application System is an individual information technology system included in the Coast Guard IT enterprise system. The Application System Perspective is developed and maintained, throughout the life of the system, by the application sponsor and/or developer and transcends the interface requirements of other application systems across the enterprise. Application system redesign or upgrade will result in updates to the

Enterprise IT Architecture documentation. Each Application System Perspective is comprised of the following mandatory products:

- Overview and System Summary,
- Integrated Dictionary,
- High-Level Functional Concept Diagram,
- Functional Node Connectivity Description,
- Functional Information Exchange Matrix, and
- System Interface Description.

The following Application System Perspective products are supplementary for complex application systems.

- Technical Architecture Profile,
- Organizational Relationship Charts,
- System Communications Description,
- System Evolution Description, and
- System Technology Forecast.

The CIO will determine the need for supplemental products on a system-by-system basis.

(e) Acquisition Support

For every IT Application System or acquisition with an IT component a Technology Readiness Assessment shall be conducted. The Technology Readiness Assessment shall examine program concepts, technology requirements, and demonstrated technology capabilities to determine technological maturity.

Technology Readiness Assessments for critical technologies shall occur in the Concept and Technology Development Phase to provide useful and timely technology maturity information to support the KDP 2 review. The Technology Readiness Assessment shall be updated at each successive KDP as necessary.

Additional guidance is provided in DoD Regulation 5000.2-R, Mandatory Procedures for Major Defense Acquisition Programs (MDAPS) and Major Automated Information System (MAIS) Acquisition Programs, in Appendix 5 *Command, Control, Communication, Computers, and Intelligence (C4I) Support Plan (C4ISP) Mandatory Procedures and Formats* and Appendix 6 *Technology Readiness Levels and Their Definitions*.

(f) Enterprise IT Architecture Documentation

The results of the Technology Readiness Assessment, when required, shall be included in the Acquisition Phase Summary (APS). Other Enterprise IT Architecture Framework Products shall be prepared in accordance with Commandant (G-CIT) guidance. IT Architecture Documentation developed during the acquisition process is shown in Table 4-22.

Enterprise IT Architecture Framework Products			
Key Decision Point 2 Documentation			
Document		**Preparation**	**Approval**
• Technology Readiness Assessment	X	SR	G-CIT
• High Level Functional Concept Document	X	SR	Sponsor
• Functional Node Connectivity Diagram	X	SR	Sponsor
• Functional Information Exchange Matrix	X	SR	Sponsor
• System Interface Description	X	SR	G-CIT/G-S
Key Decision Point 3 Documentation			
• High Level Functional Concept Document	U	SR	G-CIT/G-S
• Functional Node Connectivity Diagram	U	SR	G-CIT/G-S
• Functional Information Exchange Matrix	U	SR	G-CIT/G-S
• System Interface Description	U	SR	G-CIT/G-S
• System Evolution Description	X	PM	G-CIT/G-S
• Technical Architecture Profile	X	PM	G-CIT/G-S

Key			
X	Prepare	PM	Project Manager
U	Update	SR	Sponsor's Representative

Table 4-22, Enterprise IT Architecture Framework Products

(4) Miscellaneous Related Disciplines

The following disciplines should be considered by the PM as appropriate:

(a) Research and Development

The Coast Guard's Research and Development (R&D) program focuses on applied research; specifically, applying technology developed by other government agencies and the private sector to Coast Guard use. Use of the R&D Program may be appropriate to support some major acquisition projects or sub-elements. R&D may be used to conduct studies, technology assessments, new product design and evolution, and the improvement of existing products. R&D products may consist of materials, devices, systems or processes. The Office of Research and Development, Commandant (G-CIR), is the R&D Program Manager. Guidance on the use of R&D Program services, including R&D staff support, R&D Center support, and use of the R&D appropriation, are obtained and coordinated through G-CIR in accordance with Research, Development, Test And Evaluation (RDT&E) Appropriation; Procedures For Obtaining Services And Appropriation Definition, COMDTINST 7044.1 (Series).

(b) Human Systems Engineering/Human Systems Interface

Human Systems Engineering (HSE) addresses the people-equipment interface and applies principles of human capability to reach, lift, see, communicate, comprehend, and act to the functions and circumstances required to optimize the system. The primary objective of HSE is to influence system design to ensure that operational support requirements do not exceed the physical and mental capacities of the human operator. HSE should be included at each level of the acquisition cycle to ensure Human Systems Interface (HSI) considerations are addressed throughout the acquisition process. The PM should obtain assistance from the Office of Safety and Environmental Health (G-WKS) and the Office of Training and Performance Consulting (G-WTT) for advice and assistance to ensure the areas of HSE/HSI and human performance are adequately addressed. Additional guidance concerning HSE/HSI is provided in Enclosure (1).

(c) Metrication

Department of Transportation Transition to the Metric System, DOT Order 1020.1 (Series), and CG Transition to the Metric System, COMDTINST 5711.2 (Series) should be used to comply with requirements to consider and incorporate metric requirements early in the major acquisition process.

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5. Additional Documentation

a. Acquisition Project Baseline

(1) Purpose

This section provides guidance on the content, development and maintenance of the Acquisition Project Baseline (APB). The purpose of the APB is to establish quantified ranges for critical cost, schedule, and performance parameters throughout the acquisition phases for Coast Guard major acquisitions. APBs are required for all Coast Guard major acquisitions.

(2) Background

Major acquisition project baselines are composed of the three "pillars" of acquisitions—cost, schedule and performance, as illustrated in Figure 4-12. The APB is the primary oversight tool used by senior Coast Guard and DOT management to assess project status and is the foundation for risk management and risk assessment. Approval of the APB establishes "top level" performance thresholds and cost and schedule ranges to which the Project Manager (PM) must manage. A breach occurs if a performance parameter threshold cannot be achieved or the range for cost or schedule is exceeded. (A potential breach occurs when there is a likelihood the project will breach unless corrective action is taken or conditions change.) A breach of an established threshold causes intensive review of operational requirements and project plans to either solve the problem causing the breach or re-plan the project and establish new thresholds.

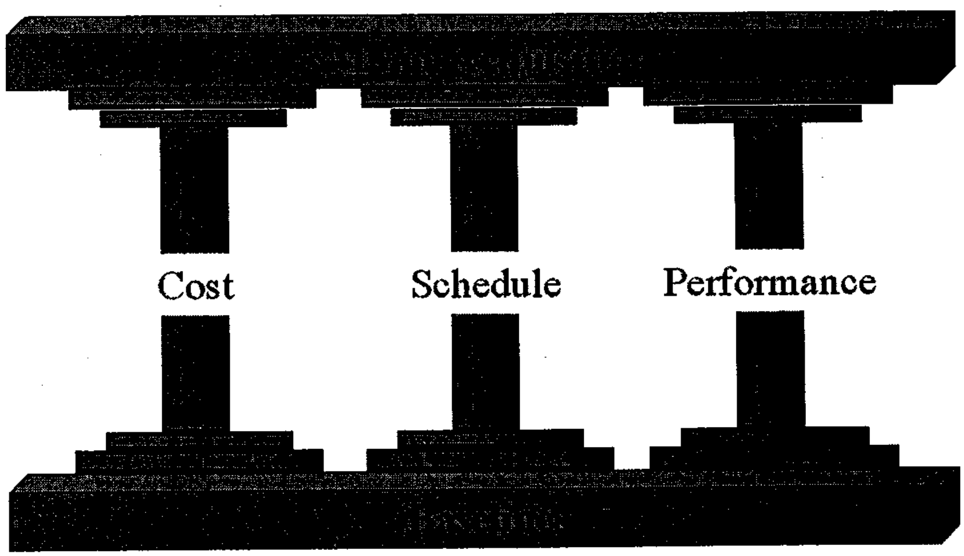

Figure 4-12, Pillars of Major Acquisition

(3) Discussion

- The APB is a top management tool that provides control to prevent unit cost growth and "requirements creep" due to unnecessary system configuration changes or imposition of new, unapproved operational requirements. The APB includes critical performance, schedule, and cost parameters and thresholds expressed in measurable, quantitative terms. The APB also includes Appendix A, which provides a quantified range for costs associated with an upcoming phase, beginning in the Concept and Technology Development Phase for projects which have a KDP 1A; and in the System Development and Demonstration Phase for those projects which do not have a KDP 1A.

- Changes to an approved APB will be made only under extreme circumstances, such as significant change in mission requirements (necessitating significant changes to the Operational Requirements Document (ORD)), schedule, project funding, or specific Congressional action. The PM may allow trade-off adjustments within the APB parameters, as long as baseline thresholds or ranges are not breached.

- Any actual or potential breaches of project baseline thresholds must be reported, via a Project Deviation Report (PDR), to the Acquisition Executive (AE). In the PDR, the PM will address the parameter that cannot be met; the reason why the parameter cannot be met; and proposed alternatives. The PDR shall propose corrective action. If the proposed corrective action for an actual breach is a change to any of the APB parameters, a new APB must be prepared and submitted for approval with the PDR.

(4) Roles and Responsibilities

The Project Manager will prepare and maintain the APB. During each phase, the PM will keep a record of project accomplishments, as measured against the APB, and an APB file containing the approved APB and any approved APB changes.

(5) Procedures

(a) Preparation

- The PM will prepare the APB, in accordance with Exhibit 4-10. The APB will be developed during the Concept and Technology Development Phase of the acquisition process for approval at KDP 2; if there is a KDP 1A, the initial APB will be approved at that time. At each succeeding KDP, the APB will be reviewed, and revised as necessary, and submitted for approval. During each phase the PM will keep a record of project accomplishments, as measured against the APB, and an APB file containing the approved APB and any approved APB changes.

- The PM should prepare the draft APB in consultation with all Program and Support Managers involved in the project.

(b) Review and Approval

- A limited CGARC concurrent clearance review of the APB shall be conducted, in accordance with the procedures in Chapter 7. While a matrix-level review is not required, the draft APB should be reviewed by G-A-2, G-ACS, the Sponsor's Representative, and G-CPA. The limited CGARC concurrent clearance will consist of review by the Sponsor, Project Director (Commandant (G-A)), and Director of Resources (Commandant (G-CRC)). After resolution of any CGARC concerns, the APB is submitted for approval by the PM; endorsed by Commandant (G-A), and the Chief of Staff, Commandant (G-CCS); and approved by the AE. When associated with a KDP, the APB will be submitted as part of the Key Decision Point Approval Package. The initial APB approval is part of the KDP 1A or KDP 2 approval, whichever occurs first.

- When associated with a KDP, APB approval will be documented in an Acquisition Decision Memorandum (ADM), by specific reference, as part of the KDP approval.

(c) APB Changes

- The parameters in the APB should be continuously assessed by the PM. When it becomes apparent that an approved APB will be breached or potentially breached, the PM is required to immediately notify the AE by means of a Project Deviation Report (PDR). The PM shall also prepare a new APB for approval by the AE. The PM will prepare the new APB and PDR as prescribed in Exhibits 4-10 and 4-11, respectively. Preparation and submission of the APB change/breach package shall be as prescribed in paragraph above.

- If a change to an approved APB occurs when a KDP is expected to occur within six months, the PM shall submit a PDR to the AE and notify the AE that the APB Change will be submitted as part of the KDP Approval Package.

(6) Documentation

Exhibits 4-10 and 4-11, respectively, present: sample APB Cover Page, APB content requirements, and APB format requirements; and sample PDR.

Sample Acquisition Project Baseline

Cover Page

Acquisition Project Baseline (APB)
for the

PROJECT TITLE

Submitted by:	Project Manager	Date
Endorsed by:	Project Director (G-A)	Date
Endorsed by:	Chief of Staff (G-CCS)	Date
Approved by:	Acquisition Executive (G-CV)	Date

Acquisition Project Baseline

Content Requirements

1. General

The content of the Acquisition Project Baseline (APB), and updates, shall address the performance, cost and schedule parameters as discussed below.

2. Contents

Section A. Performance

Performance parameters are the mission critical requirements derived directly from the ORD. All parameters listed shall contain a threshold and an objective.

- A performance parameter's threshold is the minimum value necessary to provide an operational capability that will satisfy the mission need.
- A performance objective is a value beyond the threshold that should reflect an operationally meaningful, measurable, cost-effective, affordable, impact on operations or support beyond that provided by the threshold value. In some cases the threshold and objective may be the same.

Section B. Cost

There shall be a cost range for the overall project, and for the upcoming phase provided in Appendix A. (The APB supporting the Production and Deployment KDP need not include Appendix A; all costs shall be shown in Section B. If the Production and Deployment Phase will result in several useable segments, the cost for each segment should be broken out in Section B.) The cost range shall be based on the Acquisition Plan. All parameters listed under cost shall contain a range of values that can be reasonably expected. The range shall be derived from the total acquisition costs. The range shall be the best estimate for meeting the performance and schedule parameters and is based on different probabilities of success. The range shall be supportable, consistent with, and easily reconciled to other cost estimates prepared for the project.

Section C. Schedule

The schedule events for the APB shall be based on the Acquisition Plan and Project Management Plan. All events listed under schedule shall contain a range. The range for each schedule parameter consists of a period of time (stipulated by dates, in the format shown in Table 4-5) for which a key event (such as a KDP review, design review or completion of a test activity) is likely to occur.

3. Changes

If the baseline is changed, insert a column entitled, "Change # __" and/or "Change # __/KDP # __" and list the change(s) under this columnar heading. A new column must be added each time the APB is changed; all previous changes and columns are retained. For all changes caused by a breach, insert the word "Breach" directly after the parameter change.

Acquisition Project Baseline

Format Requirements

Section A. Performance

Critical Parameter	Threshold	Objective	Change#1/KDP 3	Change #2
Speed	200 kts	250 kts		Threshold[2] 225 kts
Range	200 nm Breach	250 nm	Threshold[1] 180 nm	
Altitude	10,000 ft	12,000 ft		

1. If a parameter has been breached, describe the circumstances. Explain the basis for the new parameter.

2. If a parameter has changed, please explain the reason for it.

List critical performance parameters with quantified threshold and objectives that must be met to provide mission needs, i.e. include all parameters that are considered mission critical that are shown as Key Performance Parameters (KPPs) in the ORD. Performance includes operational, technical, and supportability parameters such as:

Accuracy	Range	Availability	Maintainability
Compatibility	Altitude	Speed	Gross Weight
Reliability	Transportability	Interoperability	Crew Size

Section B. Cost

Critical Parameters	Range	Change #1/KDP 3	Change #2
Then Year $	$400M - $420M		$405M - $425M[3]
Total RDT&E	$75M - $80M		$80M - $85M[4]
Total AC&I	$325M - $340M		
Total Quantities	10 A/C - 12 A/C		

3. Annotate the reason for the change.

4. Annotate the reason for the change.

Enter total cost (in Then Year dollars in millions) using the Total Acquisition Cost as a baseline. Cost data reflected in the baseline must select realistic cost estimates, but may not exceed the amounts in the LCCE. The basis for cost range must be defined. When the Production and Deployment Phase results in the delivery of useable segments, break out the cost of each useable segment in the table.

After it is determined, enter a reasonable and supportable range of the total quantity to be acquired. In early phases, quantity ranges should be the best estimated available. Total Quantities are for information only, there are no deviation criteria for these values.

Section C. Schedule

Critical Events	Range	Change #1/KDP 3	Change #2
KDP 2	1Q FY00 - 2Q FY00		
KDP 3	3Q FY01 - 4Q FY01	1Q FY02 - 2Q FY02[5]	
IOC	FY07 - FY08		

5. Annotate the reason for the change.

List the most critical dates (as a range) including KDPs, key test and evaluation dates, contract awards, first deployments, and other significant project dates. The following are illustrative examples only:

KDP 2

C&TD Contract

Mock-up/bread board complete

KDP 3

SD&D contract award

First article/prototype built

DT&E (start/complete)

LRIP contract award

First delivery

OT&E (start/complete)

Initial Operational Capability (IOC)

Production contract award

Operational Support Date

Final delivery

Project Disestablishment

Appendix A. Cost Baseline For Upcoming Phase

Phase (e.g., System Development and Demonstration)			
Cost Estimate	Range	Change #1/KDP 3	Change #2
Then Year $	$15M - $25M		
Total RDT&E	$5M - $7M		
Total AC&I	$10M - $18M		
Total Quantities	1 A/C - 2 A/C		

Enter total cost (by Then Year dollars in millions) for the applicable phase using the Total Acquisition Cost as a baseline. The basis for cost range must be defined.

Total Quantities are for information only, there are no deviation criteria for these values.

Sample Project Deviation Report

U.S. Department of Transportation
United States Coast Guard

Memorandum

Subject: **(PROJECT NAME)** DEVIATION REPORT

Date: **XX XXX XX**
5000

From: Project Manager, **(Project Name)**

Reply to Attn. of: **G-XXX**
PM's POC
267-**XXXX**

To: Vice Commandant

Via: (1) Assistant Commandant for Acquisition
(2) Chief of Staff

Ref: (a) Major Systems Acquisition Manual, COMDTINST M4150.2F

1. **(Project Name)** has changed from its current approved baseline, dated **MM/DD/YY**, for the following reasons. (Give reasons for the change and the impact on the project.)

2. (Describe alternatives considered other than changing the approved acquisition project baseline, the alternative recommended and why, or the reasons for not adopting any of these alternatives.)

3. I request approval for an acquisition project baseline change(s), provided as Enclosure (1).

Encl: (1) Acquisition Project Baseline

b. Exit Criteria

(1) Purpose

This section establishes the requirements, policies and procedures for the development of Exit Criteria. Exit Criteria are project specific accomplishments or performance parameters that must be satisfactorily demonstrated before a project can transition to the next acquisition phase, phase segment or production block.

(2) Discussion

At Key Decision Points (KDPs) pertaining to acquisition planning and execution, exit criteria to enter the next acquisition phase, phase segment or production block shall be proposed. The AE will use the exit criteria as a measure in determining whether the project is ready to proceed at the next KDP. Table 4-23 provides information on the timing for proposing exit criteria, their applicability and when they are evaluated by the AE.

Exit Criteria Proposal, Applicability and Evaluation		
PM Proposes at:	**Applicable to Activities Accomplished during the:**	**AE Evaluates at:**
Submission of ASP (6 Months after KDP 1)	Alternative Analysis Phase Segment **OR** Overall Concept and Technology Development Phase	Discretionary KDP 1A OR KDP 2
Discretionary KDP 1A	Alternative Refinement Phase Segment	KDP 2
KDP 2	Development and Prototyping Phase Segment **OR** Overall System Development and Demonstration Phase	Discretionary KDP 2A OR KDP 3
Discretionary KDP 2A	Low Rate Initial Production Phase Segment	KDP 3
KDP 3	1^{st} useful segment/production block **OR** Overall Production and Deployment Phase	Discretionary KDP 3A OR N/A
Discretionary KDP(s) 3A, B, etc.	Next useful segment/production block	Discretionary KDP(s) 3B, C, etc.

Table 4-23, Exit Criteria

At all KDPs, the approved exit criteria from the previous KDP will be evaluated by the AE to determine whether the project is ready to proceed to the next phase, phase segment or production block. As shown in Table 4-24, the exit criteria must be directly related to and supplement the objectives, required accomplishments and documents to be produced for the phase, phase segment or production block as described in Chapter 2.

Sample Exit Criteria	
Discretionary KDPs	**Required KDPs**
Discretionary KDP 1A for entry into the Alternative Refinement Phase Segment	KDP 2 for entry into the Development and Prototyping Phase Segment/System Development and Demonstration Phase
• Establish project matrix team • Establish preliminary operational requirements • Completion of alternative analysis • Determine acquisition strategy	• Finalize operational requirements • Demonstrate project affordability • Establish project baseline • Document feasibility and tradeoff analyses (if applicable)
Discretionary KDP 2A for entry into the Low Rate Initial Production Phase Segment	KDP 3 for entry into the Production and Deployment Phase and 1st useful segment or production block (if applicable)
• Completion of Critical Design Review (CDR)	• Successful completion of OT&E • Successful completion of IOT&E (if required) • Validate production quantity
Discretionary KDP(s) 3A, B, etc. to authorize production of the next useful segment or production block	
• Revalidate operational effectiveness and suitability • Revalidate production quantity • Demonstrate affordability of next production block	

Table 4-24, Sample Exit Criteria

(3) Roles and Responsibilities

The Project Manager with assistance of Commandant (G-A-2) will prepare all proposed exit criteria.

(4) Procedures

(a) Preparation

The format for the proposed exit criteria shall be a simple listing of the proposed major accomplishments for the upcoming acquisition phase, phase segment or production block. The first set of exit criteria shall be submitted for AE approval approximately 6 months following KDP 1 as part of the Acquisition Strategy Proposal. Subsequent exit criteria will normally be included as an attachment to the documentation package submitted at each KDP. Proposed exit criteria shall be linked to the acquisition strategy objectives contained within the MNS and project plans and tailored to each acquisition phase, phase segment or production block.

(b) Approval and Distribution

Approval will be provided by specific reference in the Acquisition Decision Memorandum (ADM), either approving the criteria in total or by documenting directed changes.

(5) Documentation

Exhibit 4-12 presents exit criteria content requirements.

EXIT CRITERIA

Contents

General

The content of the proposed exit criteria typically includes the below listed factors.

- Link the acquisition strategy objectives contained within the MNS and project plans and tailored to each acquisition phase.
- Require test reports that contain critical test results, i.e., those that demonstrate operational and technical thresholds and performance parameters.
- Require the achievement of specific project risk reduction goals.
- Require the completion of studies, i.e., specific trade-off studies, alternatives analysis, etc.
- Require the development/approval of particular documents. (It is not necessary to list the project documents required in Chapter 2.)
- Require the completion of specific key events/activities, e.g., Operational Test and Evaluation.

c. Acquisition Phase Summary

(1) Purpose

This section establishes the requirements and procedures for the development of the Acquisition Phase Summary (APS). The APS provides a summary of the results of activities from an acquisition phase, phase segment or production block.

(2) Discussion

The Project Manager will prepare and sign the APS, which is submitted at all KDPs after KDP 1. The APS shall be a simple narrative and is normally included as an attachment to the KDP documentation package submitted via the CGARC Executive Secretary for AE approval. The AE's approval of the KDP documentation package shall constitute APS approval.

(3) Contents

The contents of the APS include a summary of the results of the required studies, analyses and/or testing activities for the current acquisition phase, phase segment or production block. All required accomplishments identified for the particular acquisition phase in Chapter 2 must be addressed. In cases when completing a phase segment or a production block a subset of the required accomplishments must be addressed. Exhibit 4-13 presents APS content requirements.

Acquisition Phase Summary

Contents

General

The Acquisition Phase Summary includes the following:

a. Exit Criteria

Address the exit criteria established at the previous KDP and how they were or were not satisfied

b. Accomplishments

Address the accomplishments/activities since the last KDP including summaries as appropriate of:

- Alternative analysis results
- Feasibility study results
- Resource impact assessment
- Trade-off study results
- Preliminary Design Review (PDR) results
- Critical Design Review (CDR) results
- Environmental Impact Assessment (EIA) results
- Testing results
- Technology Readiness Assessment results

c. Issues

Address any open or pending risk issues.

d. Documentation Status

Address the current status of project planning and decision documentation.

e. Summary

Summarize the key decisions being requested and provide the PM's recommendations.

Chapter 5

RESOURCE MANAGEMENT PROCESSES

1. Background

The purpose of this chapter is to tie the parameters of Resource Management, Acquisition Management and Requirements Development together, as illustrated in Figure 5-1. Chapter 3 discusses Requirements Development and Chapter 4 discusses Acquisition Management. The content of this chapter includes resource management roles and responsibilities; and the relationships between the capital planning and major acquisition processes.

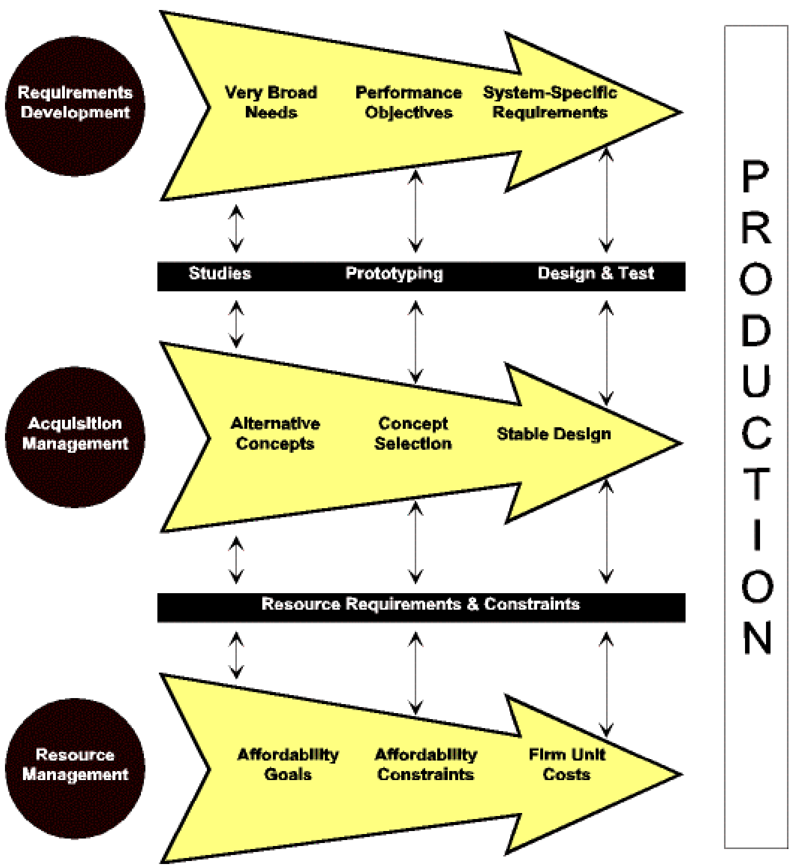

Figure 5-1, Acquisition Interactions

2. Discussion

Resource management is the dynamic process by which the Coast Guard balances short and long term needs and requirements against political and fiscal realities to acquire and allocate the resources necessary to accomplish Coast Guard missions. In the context of major acquisitions, resource management has two interdependent functions: to provide capital asset acquisition resources (funding and personnel) and to establish affordability constraints. An acquisition is one of many possible outcomes of the Coast Guard Resource Management process.

a. Coast Guard Business Planning Process

The Coast Guard Business Planning Process (summarized in the Coast Guard Agency Capital Plan, COMDTINST 7132.1 (Series) describes long range planning as a series of assessments performed to establish the public good outcomes that will be required in the future and the capabilities that we will have in the future to do what is required. When analysis of functional requirements (in terms of mission, purpose, capability, operating constraints, or other agency interactions) indicates that a capability gap exists, then a material solution, i.e., product or system acquisition, may be appropriate. The results of the analysis are documented in the integrated Coast Guard Business Plan, which also outline mission objectives, mission requirements, and baselines; and provide the required capabilities which are fed into the Agency Capital Plan (ACP) to trigger the major acquisition process.

b. Affordability Considerations

- Affordability is the degree to which the life cycle cost of a capital asset acquisition project is consistent with overall Coast Guard long range resource investment and programming allocation plans.
- Programming and affordability decisions at each KDP are considered and balanced against the annual budget costs and priorities of all acquisition programs/projects planned, for at least a five year period, and the cost-to-benefit relationship of each individual project.
- As discussed in Chapter 3, Operational Requirements are the primary parameters around which program management, resource management, and acquisition management and planning converge. Like the broad description of operational requirements, the project enters the acquisition process with a rough order of magnitude cost estimate and funding stream projection in the Mission Need Statement (MNS). This cost estimate is successively honed throughout the acquisition process, as illustrated in Figure 5-2. Cost refinement starts in the Concept & Technology Development (CTD) phase during cost and performance trade-off analyses and feasibility studies. Project cost estimates should be relatively firm when the Operation Requirements Document (ORD) is finalized. At the end of the Concept & Technology Development phase (at KDP 2) the Acquisition Project Baseline (APB) is established; within the APB cost objectives and ceilings, performance objectives and goals, and schedule objectives and ceilings are set.

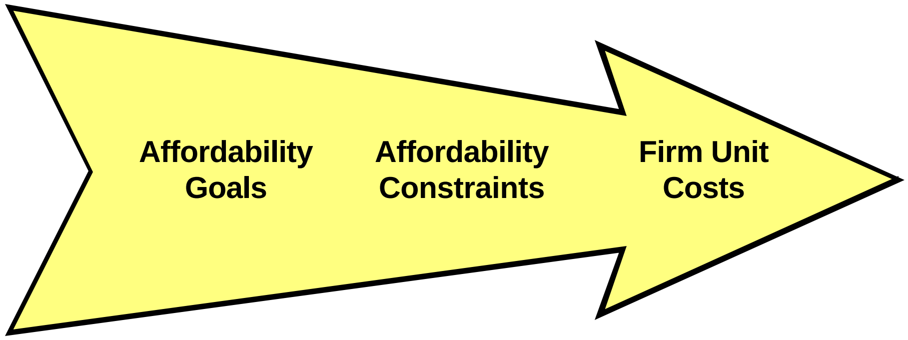

Figure 5-2, Acquisition Cost Refinement

c. Roles and Responsibilities

(1) Assistant Commandants/Program Directors

Conduct business planning and program evaluations; the summarized results of these analyses are documented in the integrated Coast Guard Business Plan.

(2) Director of Resources

Commandant (G-CRC) is responsible for the overall Resource Management process. Within the G-CRC organization, Commandant (G-CPP) administers the planning process and Commandant (G-CPA) and (G-CBU) serve as the Acquisition, Construction and Improvements (AC&I) resource manager for personnel and funding issues. Commandant (G-CBU) serves the AC&I appropriation manager and is directly responsible for all budget execution issues. Commandant (G-CRC), the Director of Resources, is responsible for the maintenance of the ACP.

(3) Director of Information and Technology

Commandant (G-CIT), Coast Guard Chief Information Office (CIO), is responsible for Coast Guard information management and the application of information technology to support mission goals including: management of the Coast Guard Information Technology (IT) asset portfolio, establishment of IT policies and standards, and oversight of IT projects.

(4) Director of Finance and Procurement

Commandant (G-CFP) establishes cost estimating policies and standards.

(5) Sponsor's Representative

Prepares the initial and pre-KDP1 ACP/Long Range Plan (LRP) submissions; develops, for inclusion in the Mission Need Statement, the KDP1 Rough Order of Magnitude (ROM) Total Acquisition Cost, and initial funding stream projections. Develops the initial Resource Proposal (RP) for project funding and personnel, and develops the RPs for follow-on operations and support.

(6) Project Manager

Prepares post-KDP1 LRP input; develops and updates the project Cost Analysis, which includes the Life Cycle Cost Estimate (LCCE) and Cost-Benefit Analysis (CBA); and prepares Budget Sheets for funding adjustments. Coordinates use of the Research, Development, Test and Evaluation appropriation with the Research and Development Program Manager, Commandant (G-CIR) in accordance with COMDTINST 7044.1 (Series). Develops inputs to the Shore Facilities Capital Asset Management (SFCAM) process for project specific shore facility requirements and coordinates necessary resource management activities with Commandant (G-CPA). Develops estimates for post-acquisition operations and support funding requirements and provides input to the Sponsor's Representative.

(7) Acquisition Resource Management Staff

Commandant (G-A-1) serves as the central coordinator for all budget information, and funding and personnel requirements within the Acquisition Directorate. Maintains the Acquisition Business Plan. Manages the Acquisition Directorate's Operational Expense (OE) appropriation and AC&I appropriation core funds. Coordinates the major acquisition review briefing schedules.

d. Long Range Planning

(1) Purpose

The Coast Guard's Long Range Plan (LRP) is Appendix D of the Agency Capital Plan. The LRP documents the Coast Guard’s capital investment outlook and is a tool for making cross-program affordability decisions for major acquisitions in current and future fiscal years. The LRP provides information needed by the AE to make realistic affordability decisions for each major acquisition, both as an individual project and as an element of the Coast Guard’s total needs. The LRP provides the means to generate the information required to facilitate affordability assessments.

(2) Background

The LRP covers the 15-year period from Budget Year+6 to Budget Year+20 and includes existing and projected programs/projects, their schedules and budget requirements. All major acquisitions are included in the LRP, regardless of their funding appropriations. The LRP includes the projected budget data to illustrate the impact of major acquisition decisions on the overall Coast Guard planning profile.

(3) Discussion

Each acquisition project’s impact and relationship to the LRP is assessed at each KDP by Commandant (G-CRC) and documented in a Resource Impact Assessment (RIA). The RIA includes consideration of support and personnel requirements, as well as the fiscal constraints of the organization. AE authorization to enter successive project acquisition phases will not be granted unless sufficient resources are or will be programmed to support the next segment of activity including: project development, testing, production, fielding and support requirements.

(4) Resource Impact Assessment Preparation

- The responsibility for the preparation of the Resource Impact Assessment is delegated to the Chief, Office of Programs, Commandant (G-CPA). Commandant (G-CPA), in coordination with the Sponsor’s Representative for KDP 1 or the PM for successive KDPs, will prepare the Resource Impact Assessment.

- The format for the Resource Impact Assessment shall be a simple narrative describing the acquisition project’s programming and affordability impacts on the LRP, annual budget costs and priorities. The Resource Impact Assessment will normally be provided to the CGARC Executive Secretary for inclusion in the documentation package submitted to the AE at each KDP. The Resource Impact Assessment is included in the Mission Need Statement at KDP 1 and with the Acquisition Phase Summary (APS) at successive KDPs.

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3. Cost Analysis

The goal of any organization acquiring assets is to provide the most efficient resource allocation available through an informed systematic decision making process. An important aspect of this decision process for acquisition is the cost analysis.

The project Cost Analysis consists of Life Cycle Cost Estimates (LCCE) and Cost-Benefit Analyses (CBA) to determine and document the resource impact on the Long Range Plan (LRP). The LCCE represents the total cost to develop, produce, operate, maintain and ultimately dispose of an asset, and the CBA is a method of comparing the relative merits of alternative solutions and/or comparing one project to another within the Coast Guard.

a. Purpose

This section sets the requirements and establishes policies and procedures for developing Life Cycle Cost Estimates (LCCE) and conducting Cost Benefit Analysis (CBA) elements of the Cost Analysis.

b. Definitions

(1) Total Ownership Cost

Total Ownership Cost (TOC), alternatively referred to as the total cost of ownership, is the sum of all costs associated with the research, development, procurement, personnel, training, operation, logistical support and disposal of an individual asset. This cost includes the total supporting infrastructure that plans, manages, and executes the asset's program over its full life, as well as the cost of requirements for common support items and systems that are incurred because of introducing the particular asset into the Coast Guard. TOC excludes "non-linked" Coast Guard infrastructure costs that are not affected by the individual asset systems' development, introduction, deployment or operations. TOC is broader and more encompassing than Life Cycle Cost (LCC).

(2) Life Cycle Cost

Life Cycle Cost is a subset of TOC. LCC are defined as direct costs associated with a program and indirect costs that can be obviously linked to a program. LCC has traditionally excluded most of the infrastructure costs needed to support a system or program. LCC estimating is performed to support acquisition, maintenance, and modification decisions. Except for program unique facilities, supporting infrastructure is not typically acquired or disposed due to the acquisition of a single system. As such, LCC normally excludes infrastructure costs as not relevant to the decision being made.

c. Background

(1) Life Cycle Cost Estimating

The LCCE identifies the total cost to the Government of an item or system over its useful life, including development, procurement, ownership, operation, support, and disposal. In acquisition, cost is a parameter equal in importance to technical performance and schedule. Historically, a low initial acquisition cost for hardware has not assured a low life cycle cost. In fact, the opposite may be true. The majority of system LCC is typically incurred in the operations and support (O&S) area. By Key Decision Point (KDP) 2 roughly 70% of a system's LCC is typically "locked in" by design decisions while less than 5% of its total LCC has actually been expended. The greatest potential opportunity for cost reduction lies in controlling the high cost of system support early in the acquisition process.

(2) Cost Benefit Analysis

The cost benefit analysis is a systematic and formal economic analysis of the relationship between the life cycle cost and the operational effectiveness of an alternative solution to the mission need. It acts as a decision tool that indicates the advantages and disadvantages of an alternative, along with the sensitivity of key decisions and assumptions of that analysis.

A cost effectiveness analysis is a less rigorous technique used when the benefits of competing alternatives are essentially the same or can not be accurately quantified. This would apply when policy decisions have been promulgated to provide a service or benefit. For purposes of this instruction, a cost benefit analysis and cost effectiveness analysis can be assumed to be interchangeable.

d. Discussion

(1) Life Cycle Cost

LCC is an important project decision making and risk management tool. Life Cycle Cost Estimate (LCCE) analysis and documentation is required to facilitate and support KDP reviews and decisions.

- During the Concept & Technology Development (CTD) Phase, the LCC effort focuses on identifying cost drivers (or problems), evaluating <u>relative</u> LCC differences among competing alternative concepts, and developing the LCCEs to support the KDP 2 decision.

- During the System Development & Demonstration (SDD) Phase, the LCCE established in CTD is refined. In addition, in SDD the LCC begins its transition from primarily a design element to a control element for the project. All decisions should be considered in light of their effect on LCC, but at this point in development, LCC is more of a control tool for keeping the project on track by highlighting the effect that decisions and changes will have on total program cost.

- During the Production & Deployment Phase, specifically in Deployment, the LCC is used to consider the impact of modifications, value engineering proposals, product performance agreements, post-production support planning and execution, and disposal efforts.

(2) Life Cycle Cost Components

LCC components are identified in Figure 5-3. **LCC** means **Total Acquisition Cost** plus **Operations and Maintenance (O&M) Costs** (operation, maintenance, training, support, depot development and support, post-production support, and disposal costs) over the life of an item, system, platform or equipment. **Total Acquisition Cost** means all costs for acquiring, by contract, interagency agreement, and/or other funding instruments, the supplies and/or services for a designated program or project through purchase or lease, whether the supplies are already in existence or must be created, developed, demonstrated, and evaluated, and without regard to the type(s) of appropriated funds used. Exhibit 5-1 provides discussion of the Total Acquisition Cost components. As a guide, the LCCE can be developed along the work breakdown structure elements described in MIL-HDBK-881, Work Breakdown Structures.

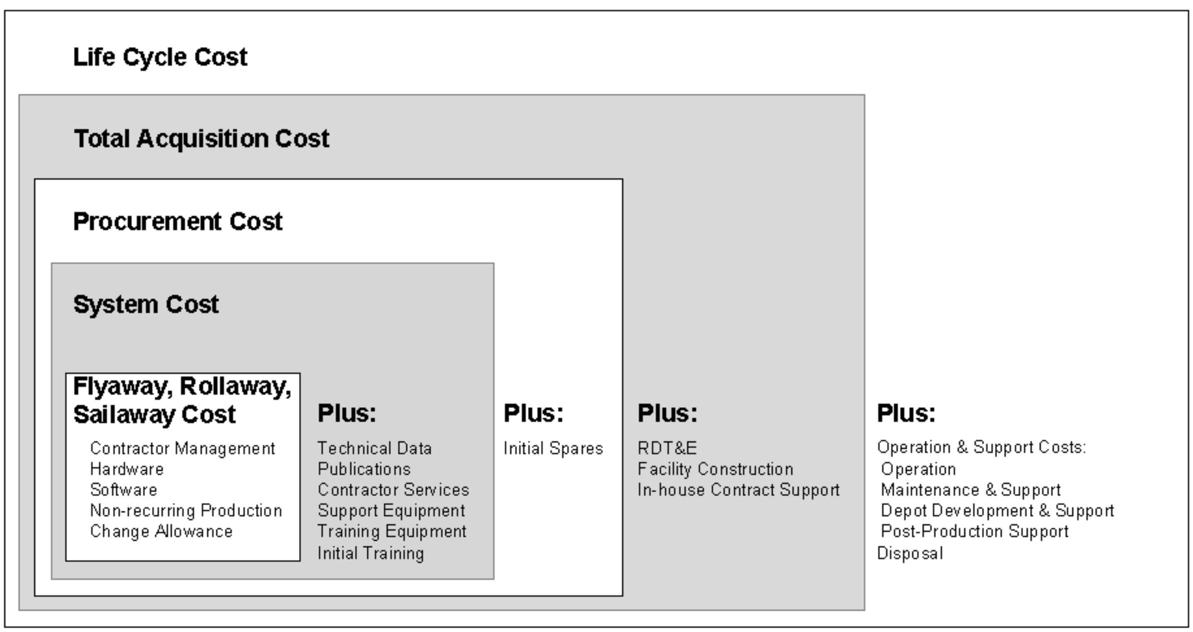

Figure 5-3, Life Cycle Cost Components

(3) Cost Benefit

The required elements of an acceptable cost benefit analysis are outlined in Office of Management and Budget (OMB) Circular A-94 "Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs." The OMB Circular also provides guidance for Cost-Effectiveness and Lease-Purchase analyses. The guidance and principles outlined in Circular A-94 apply to all agencies of the Federal Government and must be followed when submitting analyses to OMB in support of legislative and budget programs. Specifically, these guidelines apply to any analysis used to support decisions to initiate, renew, or expand programs or projects by the agency. Cost benefit and cost effectiveness evaluations are an integral part of the decision process by the CGARC. CBAs provide analysis to:

- Aid decision-making by clearly indicating the relative advantages and disadvantages of the concepts or alternatives being considered and the sensitivity of each concept or alternative to possible changes in key assumptions;
- Facilitate communications by early identification and discussion of reasonable concepts or alternatives among decision makers and staffs at all levels; and
- Document acquisition decisions by providing the analytical substantiation or rationale for decisions on a project.

Total Acquisition Cost Components

The Total Acquisition Cost of a major acquisition project is the sum of: Sailaway/Rollaway/Flyaway Costs, System Costs, and Procurement Costs, and Facilities Costs. A description of the cost components for each of the cost categories is provided in this exhibit.

1. Sailaway/Rollaway/Flyaway Costs

These costs include all the costs of designing, developing, and constructing the asset, and the contract and project management costs described below.

a. Asset Development Costs

- Funding required to award the basic contract to procure the asset.
- Funding required to exercise options under the basic contract.
- Funding required to continue to meet contract obligations under the existing basic contract, i.e., contract escalation, cost of living adjustments, etc.
- Funding required for procuring the Government Furnished Equipment (GFE) portion of the finished asset, i.e., permanently installed GFE equipment.
- Funding required to staff the project including dedicated project and dedicated matrix personnel.

b. Basic Contract Change Allowance

Funding required to offset projected contract growth due to specification oversights and/or requirements changes.

c. Retrofit Allowance

Funding authorized to upgrade initial asset(s) to standard configuration after delivery but prior to termination of the project. These upgrades are generally due to configuration changes through the project life cycle as problems are identified during follow-on asset production. Normally, this money would be expended outside the basic asset development contract.

d. Project Costs

(1) Internal Project Administration Costs

- Cost of administrative supplies (office supplies, etc.).
- Training of project and PRO personnel.
- Project and PRO personnel travel costs.
- Cost of computer equipment, etc. for project and PRO offices.
- PRO Office start-up costs.
- Preliminary Acceptance Test (PAT) and Final Acceptance Test (FAT) costs.
- Commissioning crew costs (training, travel, asset acceptance costs, etc.).

(2) External Project Support Costs

- Funding of project-related tasks under existing support services contracts not created for the project.
- Support services contract costs - project created contracts.
- Other Government Agency (OGA) Support Costs - tasking of other agencies through Memorandum of Agreements (MOA), Military Interdepartmental Procurement Request (MIPR), etc.

(3) Operational and Independent Operational Test and Evaluation Costs

- Costs of Test and Evaluation (T&E) outside of basic contract.

2. System Costs

Includes all of the above costs plus the Outfitting Costs described below.

- Technical data development/publication costs.
- Cost of initial training for familiarization or to operate/maintain the “Asset”. Includes training hardware, documentation, and personnel resources to support this initial training or the procurement of such hardware and documentation for similar follow-on training through the Asset’s life cycle.
- Cost of maintenance planning to ensure follow-on Operational Expense (OE) funding is in place maintenance, facilities, and support equipment and personnel.
- Support equipment procurement costs.

- Contractor services costs.

3. Procurement Costs

Includes all of the above costs plus the Outfitting Costs described below.

- Outfitting (Allowance Equipage List (AEL) Items).
- Initial System Spares Costs (includes Contractor Furnished (CF) and Government Furnished (GF) spares).
  - ♦ Shore-based spares (e.g., catastrophic casualty and training spares).
  - ♦ Initial Allowance Parts List (APL) spare parts outfit for the asset (ship or shore asset; or the aviation equivalent).
  - ♦ Initial Inventory Control Point (ICP) stock of spare parts.

4. Total Acquisition Costs

Includes all of the above costs plus the Facilities Costs described below.

- Building of new facilities to support the Asset - examples are channel dredging, procurement of buildings/equipment/piers/hangars for direct asset support (organizational level support), procurement of buildings and equipment for depot level support including supply center facilities and training center facilities, etc.
- Upgrade of existing facilities to support the Asset both at the organizational level (direct support) and at the depot level (supply centers, training centers, etc.).
- Leasing of facilities/hardware for short-term support of the Asset, e.g., leasing of warehouse space, testing and acceptance equipment, temporary support equipment, etc.

(4) Roles and Responsibilities

- The Project Manager is responsible for developing and updating the Cost Analysis in preparation for KDP 2 and subsequent KDPs.
- Commandant (G-A-2) will provide development guidance for Cost Analyses.
- Commandant (G-CFS) will provide standard costs for Cost Analysis development.
- Commandant (G-SLP) will provide guidance on Total Ownership Costs (TOC) and Life Cycle Costs.

(5) Procedures

(a) Preparation

- The PM shall prepare an initial Cost Analysis, in accordance with Exhibit 5-2 by KDP 2. Exhibit 5-2 presents a sample Cost Analysis Cover Page, and the Cost Analysis content and format requirements.
- The PM should prepare the draft Cost Analysis in consultation with all Program and Support Managers involved in the project to ensure all appropriate cost and benefit elements are addressed.

(b) Review and Approval

A Matrix-level concurrent clearance review of the Cost Analysis shall be conducted (be sure to include G-CPA, G-CPP, and G-A-1), in accordance with the procedures in Chapter 6. After resolution of matrix concerns, the Cost Analysis is submitted for approval. However, if matrix-level review results in a non-concur response, receipt of substantive comments, or a significant change to the Cost Analysis, a CGARC-Level Concurrent Clearance may be required. The PM will provide the document package to the CGARC Executive Secretary recommending whether the document should be routed for CGARC concurrent clearance. Following all required clearances, the Cost Analysis is submitted by the PM, via the CGARC Executive Secretary, and approved by Commandant (G-A).

(c) Updates

As a minimum, the Cost Analysis shall be reviewed and updated as required at each subsequent KDP, and may be provided as a supporting document to the respective decision documents forwarded to the AE. In addition, the Cost Analysis shall be updated if significant changes in project execution plans, schedule, resource requirements, or projected benefits occur. All changes to the Cost Analysis should be denoted by change bars in the right margin. The review and approval process for Cost Analysis Updates shall be in accordance with the paragraph above.

SAMPLE COST ANALYSIS

Cover Page

Cost Analysis
for the

PROJECT TITLE

Submitted by: ______________________ ____________
Project Manager Date

Approved by: ______________________ ____________
Project Director Date
Commandant (G-A)

Cost Analysis

Content Requirements

1. General

Estimates shall be based on program objectives, operational requirements, and contract specifications for the system (or services) and shall identify all elements of cost that will be entailed by a decision to proceed with development, production, operation and support of the item or system.

2. Contents

The Life Cycle Cost Estimate (LCCE) section, at a minimum, shall include the below listed factors.

- Cover all alternatives that are being considered for the decision at hand, including a presentation of the LCC of the legacy asset;
- Include the entire program as currently planned, rather than limiting costs to an arbitrary term of years;
- Include all cost categories and appropriations;
- Include all applicable budget accounts and categories;
- Include the value of items procured for some other purpose, but used on the system; and
- Include total acquisition costs, regardless of funding source or management control.

The Cost Benefit Analysis (CBA) section typically includes the below listed factors.

- A summary of all cost and benefit calculations must be provided, appropriately arrayed such that marginal differences of each alternative are clearly displayed. Uncertainties and assumptions used in the analysis should be clearly indicated in this summary.
- A sensitivity analysis should also be conducted, as appropriate, to highlight the magnitude or impact of realistic uncertainties in key performance criteria, operational scenarios, or other baseline parameters.
- Life cycle costs used in the cost benefit analysis must be the same as those costs identified in the project Life Cycle Cost Estimate (LCCE) section.

3. Support Documentation

The documentation (narrative backup and audit trail detail) in support of Cost Analysis shall provide sufficient information about the way the estimates were developed and the rationale for any assumptions made so that the estimates can be analyzed and reviewed by an independent source.

4. Change Analysis for Refined/Updated Cost Analyses

Describe in narrative, at successive KDPs, the changes since the previous estimate was submitted and approved. Highlight significant cost drivers (problems) and discuss their real or potential impact on/issues regarding the project costs, benefits, schedule and performance.

Chapter 6

ADMINISTRATIVE PROCESSES

1. Background

Effective acquisitions require efficient dissemination of information to all levels of the organization. This Chapter discusses the briefings and reports, documentation review and approval procedures and other administrative matters that are routinely required for major acquisitions. Required formats and contents are provided along with any procedures that are to be followed.

2. Roles and Responsibilities

By Chief of Staff charter, the Project Manager (PM) is responsible for the overall conduct of a major acquisition project. One of those significant responsibilities is to provide various reports and briefings to upper management in the Coast Guard, Department of Transportation (DOT), and Office of Management and Budget (OMB), and the Congress. The roles and responsibilities of the Coast Guard Acquisition Review Council (CGARC) are discussed in Chapter 2. The roles and responsibilities of other organizations will be addressed as required for each administrative process included in this chapter.

3. Administrative Processes

a. CGARC Briefings

The CGARC conducts reviews of the major acquisition projects at each Key Decision Point (KDP) and prior to the approval of the Acquisition Plan (AP). CGARC briefings can also be conducted to discuss project issues that require senior management attention.

- For all major acquisitions the Sponsor's Representative will present a briefing to the CGARC at KDP 1. The PM will present a briefing to the CGARC at all subsequent KDPs. These briefs should be structured in accordance with the format requirements prescribed in Exhibit 6-1.
- The project documentation required at each KDP or for AP approval should complete the CGARC documentation review process prior to the convening date of the CGARC meeting. For scheduling purposes, ample time should be allowed for the completion of the documentation review process. Although various factors

can influence the scheduling of a CGARC, as a general rule, when the last document requiring a CGARC review is released for concurrent clearance, the Sponsor's Representative/PM should contact the CGARC Executive Secretary to schedule a CGARC briefing. The CGARC Executive Secretary will also advise the Sponsor's Representative/PM on activities, required CGARC documentation and approval routing procedures prior to and immediately following the CGARC briefing.

b. Semi-Annual Review Briefings

Semi-annual review briefings allow for the review of major acquisition projects and facilitate the flow of information across directorates and to senior management. Specifically, the PM conducts Semi-annual review briefings for CGARC members and/or DOT personnel and their staffs to provide the attendees with a complete and current status of the project. Commandant (G-A-1) is responsible for scheduling and coordinating Semi-annual review briefings. The format for Semi-annual review briefings is prescribed in Exhibit 6-2.

Coast Guard Acquisition Review Council Presentations

1. General

This exhibit provides content guidance for the preparation of CGARC KDP and AP reviews.

2. Preparation

The Sponsor's Representative (at KDP 1) and the PM (at subsequent KDPs/AP approvals) shall prepare CGARC review presentations as discussed below. Briefings, which do not fall into these categories, should be structured to provide the same types of information.

The Sponsor's Representative/PM will coordinate with the CGARC Executive Secretary no later than 12 working days before the CGARC briefing in order to determine presentation particulars.

3. Content Requirements

The CGARC briefings should address each of the items discussed below.

a. Key Decision Point 1

(15 minutes maximum)

(1) Decision(s) Requested

State the decision(s) requested of the Acquisition Executive (AE) such as: approval of the MNS; project designation ; and authorization to proceed to the next logical phase.

(2) Required Mission(s) and Need

Address the required mission(s) in broad functional terms and capabilities.

(3) Capability Gap

Describe the difference in current capability versus future needs and why existing capabilities and resources will be unable to perform the mission(s).

(4) Proposed Acquisition Alternatives

Discuss what alternatives will be considered to satisfy the mission need.

(5) Acquisition Goals and Objectives

State the acquisitions goals and objectives.

(6) Resources

Indicate the rough-order-of-magnitude acquisition costs for the project, the general priority of the mission, and the planned capability for the Coast Guard. Note potential project costs compared to legacy asset life-cycle costs.

(7) Major Acquisition Designation Criteria

With the assistance of Commandant (G-A-2), address the major acquisition designation criteria identified in Chapter 3. Discuss the potential project risks that warrant top management attention and formal G-A project management.

(8) Key Issues

Identify key project issues.

b. Subsequent Key Decision Points

(15 minutes maximum)

(1) Decision Requested

State the decision(s) requested such as approval to enter the next acquisition phase.

(2) Mission Need

Revalidate Mission Need Statement (MNS) or explain changes requested.

(3) Current Project Status

Discuss where the project stands relative to the Exit Criteria established at the previous KDP.

(4) Results of previous phase activities

Discuss the results of the previous phase activities including technical capabilities, risk, schedule, life cycle cost estimates, cost benefit analyses, testing, etc.

(5) Acquisition strategy for the next phase.

Address logistics support, configuration management, training, and test and evaluation.

(6) Project Risk

Explain what the project risks are (cost, schedule and performance) and how they are being addressed.

(7) Total Project Funding Requirement

Identify any funding deficiencies (if applicable).

(8) Affordability

Discuss supportability, cost drivers, major trade-offs and the relationship to the Agency Capital Plan (ACP).

(9) Acquisition Project Baseline (APB)

Identify the key parameters to be included in the baseline for cost, schedule and performance (if applicable).

(10) Next KDP

Discuss where the project is going and what events, including testing, will occur prior to the next KDP (if applicable).

(11) Proposed Exit Criteria

(If applicable).

(12) Key Issues

c. Acquisition Plan Approval

(15 minutes maximum)

(1) Decision Requested

Provide a short project description and the decision requested.

(2) Current Status of Project

Describe the acquisition strategy and the results of that strategy which brought the project to its present point.

(3) Proposed Contracting Strategy

Discuss competition, contract type, contractor performance measurement.

(4) Acquisition Strategy Goals and Objectives

Address logistics support, configuration management, training, and test and evaluation.

(5) Total Project Funding Requirement

Identify funding required for the proposed acquisition strategy.

(6) Key Issues

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Semi-Annual Review Briefings

Content Requirements

(1) Project Summary

The mission of the project (what capability it will provide, what problem it will solve and who is the sponsor) should be clearly described. The quantity of systems/equipment to be acquired, if known, should be identified. The current acquisition phase of the project, when the previous KDP was approved, and when approval will be sought for the next KDP should be included.

(2) Achievements Since Last Briefing

Highlight significant progress since the last Semi-annual review briefing and identify the status of any action item(s).

(3) Performance

Contrast technical, cost and schedule performance status/progress against the approved baseline. Potential baseline changes should be discussed.

(4) Documentation Status

Provide the planned and actual delivery date for each document or update required in Chapter 2. Address any issues preventing the on-time completion of a document as well as any potential impact on the project.

(5) Risk Assessment

Provide a summary assessment of overall programmatic risks for technical, schedule and cost and an explanation of that assessment.

(6) Total Project Schedule

Provide the initial and current project schedule, with all KDPs and key project events identified. Highlight any important events in the next six months.

(7) Project Funding

Provide the funding history and projections for the project including research and development (R&D), acquisition (AC&I), and operational (OE) funds. Provide a comparison of the budgeted amounts to current estimates, identifying funding surplus or shortfall for each fiscal year.

(8) Contract Information

Identify all funding information for each active contract; showing the original and current contract amounts. Include a status of all undefinitized actions and include key option exercise dates.

(9) Concerns or Key Issues

Identify and describe each important technical, cost and schedule concern that has surfaced in the project and remains unresolved. Discuss the impact the concern has, or might have, on project execution and/or funding.

(10) Action Items

Summarize any action items for tracking and discussion at future Semi-annual review briefings.

c. Document Review, Clearance, and Approval Process

(1) Acquisition Planning Documents

Acquisition planning documents are those documents, which require "Matrix-level" review and Commandant (G-A), Sponsor, or Chief of Staff approval. Planning documents include, but are not limited to, the Preliminary Operational Requirements Document (PORD), Project Management Plan (PMP), Test and Evaluation Master Plan (TEMP), Integrated Logistics Support Plan (ILSP), Cost Analysis and Project Termination Plan (PTP) (and any updates to those plans). The following procedures apply:

- The Project Manager (PM) or Sponsor's Representative (as appropriate) will draft the document, with input from cognizant matrix elements, in accordance with this Manual. The completed draft document will be distributed to the matrix elements, including Commandant (G-CPA), for "Matrix-level" concurrent clearance. The "Matrix-level" concurrent clearance review can be conducted electronically at the discretion of the Project Manager/Sponsor's Representative. Additional documentation information is accessible on the Commandant (G-A-2) Intranet Web Page at http://cgweb.comdt.uscg.mil/G-A-2/pages/main.html.

- Upon resolution of the matrix comments, the PM/Sponsor's Representative will provide the document package to the CGARC Executive Secretary recommending whether the document should be routed for CGARC concurrent clearance. If the "Matrix-level" review results in a non-concur response, receipt of substantive comments, or a significant change to the planning document, a CGARC concurrent clearance may be required. A "non-concur" response should be based upon substantive objections to the reviewed document.

- If a CGARC-level review is required after the "Matrix-level" review, the CGARC Executive Secretary will release the document package to the CGARC for concurrent clearance. The package should contain the revised document; background material consisting of copies of the comments received during the "Matrix-level" concurrent clearance and a summary of the drafting office's actions to adjudicate the comments. Include also a list of the matrix offices and their responses (i.e., concur, non-concur) on the original "Matrix-level" concurrent clearance sheet; and a CGARC concurrent clearance form completed as shown in Table 6-1 . Commandant (G-A-2) will assist in developing the explanatory remarks section and more information on the CGARC package configuration is available on the Commandant (G-A-2) Intranet Web Page at http://cgweb.comdt.uscg.mil/G-A-2/pages/main.html.

CGARC Concurrent Clearance Form Instructions	
Concurrent Clearance Form	**Information Required**
• Return To:	• PM's (Sponsor's Rep's) Staff Symbol
• Explanation/Remarks/ Digest	• Background info; status of prior clearances; if update, date previous document signed (G-A-2 will assist)
• Clearance Copies Routed To	• CGARC Members (G-CRC, G-CFP, G-CIT, G-A, G-L, G-S, G-W, and the Sponsor)
• Date/Deadline Date	• Leave blank
• Originating Office	• CGARC Executive Secretary
• Originator's Contact	• PM's (Sponsor's Rep's) Point of Contact, Room Number, Phone Number

Table 6-1, CGARC Concurrent Clearance Form Instructions

- The CGARC Executive Secretary will sign the concurrent clearance sheet and release the document for review by the CGARC members. The CGARC Executive Secretary will establish the due date based on the documents time sensitivity and other documents out for CGARC review.

- The document drafter (i.e., Project Manager or Sponsor's Representative) will collect the CGARC responses, incorporate the CGARC comments, and summarize the responses and the drafting office's actions on the original CGARC concurrent clearance sheet.

- After resolution of matrix and/or CGARC comments and issues and following the CGARC meeting, the Project Manager (Sponsor's Representative) shall prepare the final package to include the items listed in Table 6-2. Routing for sequential clearance is shown in Table 6-3.

Planning Document Approval Package Contents
• The Revised Document (with Block Yellow of Cover Page)
• The Reviewed Version of the Document
• Copies of the "Matrix-level" or CGARC Responses, as appropriate
• Original Concurrent Clearance Form with Response Action Summary
• Any Necessary Transmittal Letter or Digest

Table 6-2, Planning Document Approval Package Contents

Planning Document Routing Sequence
• Project Manager or Sponsor's Representative
• CGARC Executive Secretary (G-A-2)
• Assistant Commandant for Acquisition (G-A)
• Sponsor (as appropriate)
• Other Program Director's (as appropriate)
• Chief of Staff (G-CCS) (as appropriate)

Table 6-3, Planning Document Routing Sequence

- Following approval of the document, the PM (Sponsor's Representative) shall distribute signed and dated copies of the document to all elements, as a minimum, that have participated in the "Matrix-level" and CGARC review process. Copies may be sent to other interested elements, as appropriate.
- The acquisition planning document sequence is provided in Figure 6-1.

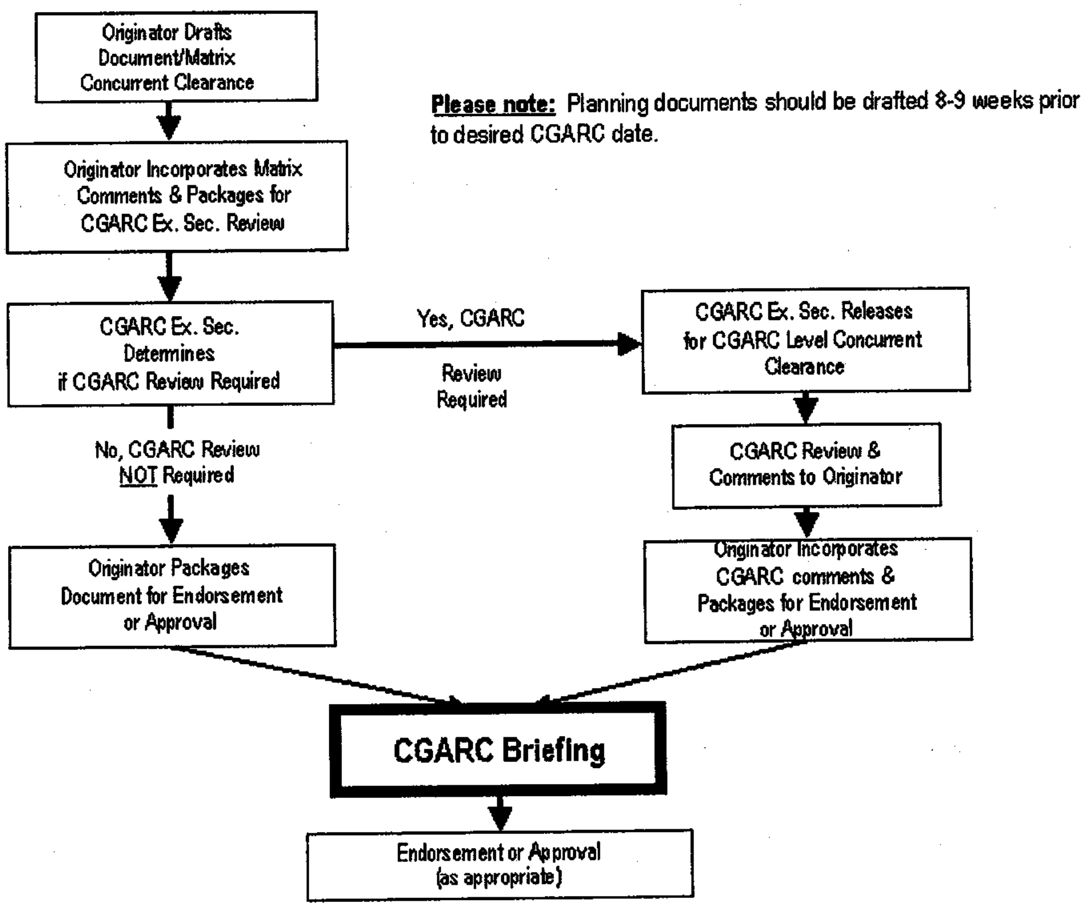

Figure 6-1, Acquisition Planning Documentation Sequence

(2) Acquisition Decision Documents

Acquisition decision documents include, but are not limited to, the MNS, Acquisition Strategy Proposal/AP and ORD (and any updates to those documents). The Acquisition Project Baseline (APB) and Exit Criteria are decision documents but are reviewed and cleared by different procedures discussed in Chapter 4.

- The Acquisition Decision Documents shall be reviewed through a "Matrix-level" and CGARC concurrent clearance. (Refer back to the specific section on each decision document for additional guidance on document preparation, review and approval.) The same "Matrix-level" and CGARC concurrent clearance procedures discussed for acquisition planning documents apply for decision documents until the preparation of the final package.

- The final package shall contain an Action Memo with the appropriate attachments. An Action Memo is prepared as shown in Exhibit 6-3. The CGARC Executive Secretary will assist in preparation of the package. The routing sequence is shown in Table 6-4.

Decision Document Routing Sequence
• Project Manager or Sponsor's Representative
• CGARC Executive Secretary (G-A-2)
• Assistant Commandant for Acquisition (G-A)
• Other Program Directors (as appropriate)
• Chief of Staff (G-CCS)
• Acquisition Executive (G-CV)

Table 6-4, Decision Document Routing Sequence

- Following receipt of the Acquisition Decision Memorandum signed by the AE, the CGARC Executive Secretary shall distribute signed and dated copies of the documents to all elements that have participated in the CGARC review process. Copies may be sent to other interested elements, as appropriate.

- The acquisition decision document preparation and review timeline is provided in Figure 6-2.

Key Decision Point Action Memo

U.S. Department of Transportation

United States Coast Guard

Memorandum

Subject: **(PROJECT NAME)** COAST GUARD ACQUISITION REVIEW COUNCIL (CGARC) KEY DECISION POINT (KDP) X PACKAGE

Date: **XX XXX XX**
5000

Reply to Attn. of: G-A-2
(CGARC Ex. Sec.)
267-0461

From: Assistant Commandant for Acquisition

To: Vice Commandant

Via: Chief of Staff

1. **Background.** Briefly provide project specific information. Give a clear, but concise statement of the situation.

2. **Discussion.** Briefly present all necessary background information explaining the needed action. Discuss any relevant issues.

3. **Recommendations.** Briefly indicate the actions/approvals recommended.

Encl: (1) Mission Need Statement (Update, if appropriate)
(2) Acquisition Plan (Update)
(3) Acquisition Project Baseline (Update)
(4) Acquisition Phase Summary
(5) Proposed Exit Criteria
(6) Resource Impact Assessment

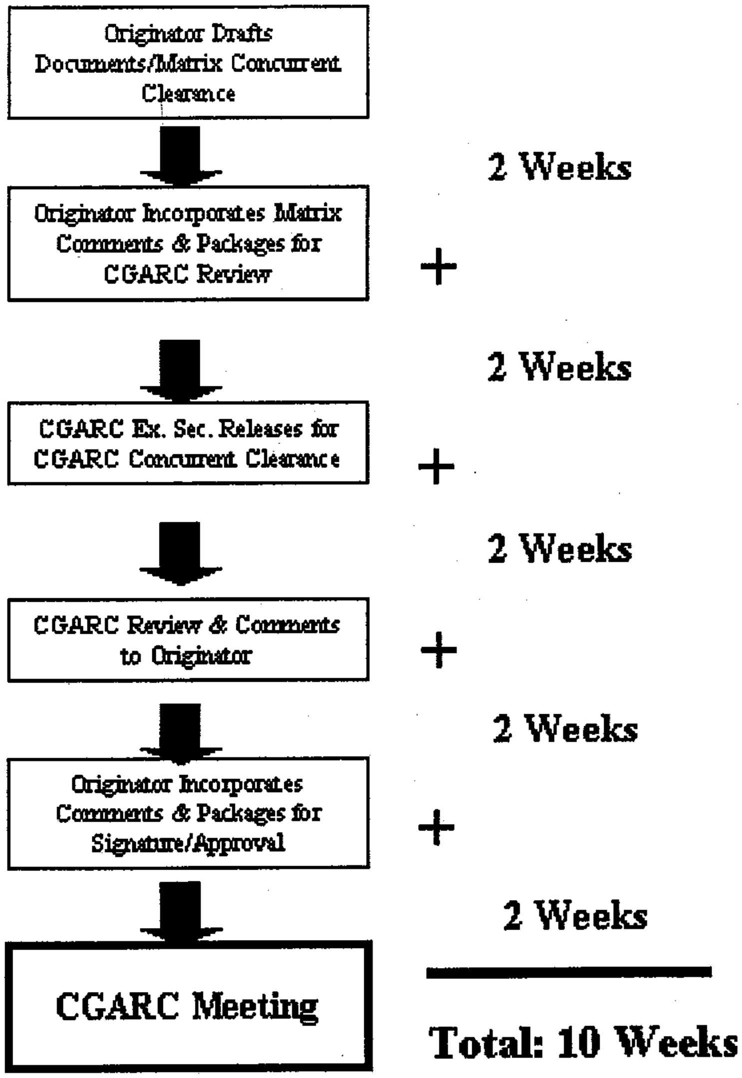

Figure 6-2, Acquisition Decision Documentation Timeline

d. Contract Review Boards

Contract Review Boards (CRB) are part of the Coast Guard's overall effort to improve its procurement process in accordance with the Procurement Management Review Program, COMDTINST 4200.30 (Series). The board is chaired by Commandant (G-CPM) and its membership includes the PM, Commandant (G-ACS) and Commandant (G-LPL).

e. Mandated Management Reports

(1) Acquisition Monthly Reports

The Acquisition Monthly Report is a status report on all major acquisitions and selected other non-major acquisitions. The report is submitted to the Chief of Staff by Commandant (G-A). It is prepared every month by Commandant (G-A-1), based on information provided by the PMs, Commandant (G-ACS), and other Acquisition Directorate Staff Chiefs, as required. The Acquisition Monthly Report provides Coast Guard top management with the current status of cost, schedule, and performance issues.

(2) Quarterly Report to the Congress

The FY 2001 Department of Transportation and Related Agencies Appropriation Act (Public Law 106-346) requires the Coast Guard to submit a quarterly report on acquisition projects, including abbreviated information on the status of shore facility construction and renovation projects. This reporting requirement is coordinated by Commandant (G-A-1) several weeks prior to the end of each quarter based on information provided by the PMs and other cognizant Headquarters Office/Staff Chiefs. Commandant (G-CBU) and Commandant (G-CPA) provide assistance with the review and coordination of the report. By the end of each quarter, the Commandant forwards copies of the Quarterly Report to the respective Chairmen of the Senate and House Subcommittees on Transportation and Related Agencies, Committee on Appropriations.

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f. DOTIG/GAO Audits

(1) Purpose

This section emphasizes the responsibilities and requirements for acquisition project personnel awareness and involvement in audit or evaluation activities by the DOT Office of the Inspector General (DOTIG), the General Accounting Office (GAO) or other agencies. These requirements apply to all acquisition projects.

(2) Background

All acquisition Project Managers (PMs) should be prepared for eventual audit of their assigned project(s). Cooperation with auditors or evaluators, positive support of audit and evaluation efforts and proactive audit follow-up on agreed to corrective actions are essential elements of audit/evaluation conduct. Table 6-5 depicts related directives containing the policy, responsibilities and required procedures for audits in general and DOTIG and GAO audits in particular. Audit policy and procedures emphasize the following "lessons learned."

Related Audit Directives
• Audits and Evaluations of Coast Guard Units and Activities, COMDTINST 7520.2 (Series)
• Coast Guard Management Control Systems Program, COMDTINST M5700.9
• OIG Audit and Investigation Report; Findings, Recommendations, and Follow-up Action, DOT Order 8000.1 (Series)
• OIG Audit Procedures, DOT Order 8000.6 (Series)
• Audit Services for DOT Contracting Offices, DOT Order 8000.7
• GAO Audit Relationships and Reports Follow-up, DOT Order 2960.1B
• Paperwork Management Manual, COMDTINST M5212.12 (Series)

Table 6-5, Related Audit Directives

- Audits are planned and conducted on DOT projects, operations and activities to recommend policies to promote economy, efficiency, and effectiveness; and to investigate fraud, waste, abuse, and mismanagement. Audits should be viewed as positive management tools to indicate areas for management improvement.
- Audit agencies and their auditors/evaluators determine the audit purpose and focus. Audit criteria include common sense items such as policy and regulatory compliance, and good record keeping.

- Acquisition Project Managers (PMs) should expect their projects to be audited at least once during the life of the acquisition.

- A well established and documented project file is the best means to support or defend the project effort and form a reasonable basis for audit findings and recommendations. Documented project information gives the audit group a tangible basis to review the project and develop objective conclusions and recommendations. Complete documentation is the key to successful audit conduct and closure.

- Agreed to corrective actions taken by management officials with regard to findings and recommendations are essential for improving the effectiveness and efficiency of the Coast Guard.

- Where another federal agency is the cognizant federal auditor (such as the Department of Defense Inspector General (DODIG)), the DOTIG will review reports received from the cognizant federal auditor for applicability to DOT.

(3) Types of Audits

Project Managers and their support matrix personnel may be involved in a variety of audits. With the recent institution of the Chief Financial Officers (CFO) Act and increased focus on government procurement integrity, the PM is included in a department-wide assessment of Federal Managers' Financial Integrity Act (FMFIA) reporting accuracy and effectiveness of corrective actions. In addition to regulatory and policy compliance, other audits might examine how a project developed and documented its acquisition requirements in a certain area (supply support for instance); contracting; financial management; project cost, schedule or technical performance; or management measures taken to reduce risk, improve affordability and effectiveness, and eliminate duplicative efforts.

(4) Audit Roles and Responsibilities

As shown in Table 6-5, audit roles and responsibilities are published in various related directives. In the event of an actual audit, appropriate Headquarters audit liaison personnel will brief major acquisition project personnel on their audit roles and responsibilities. The following audit roles and responsibilities are presented for project management familiarization purposes.

(a) Department of Transportation Inspector General

The Department of Transportation Inspector General (DOTIG) heads the DOT Office of Inspector General (OIG or J-1) and serves as the auditing agent of the Secretary of Transportation. The DOTIG is authorized and directed to conduct audits of Coast Guard activities, programs and operations as appropriate.

(b) General Accounting Office

The Comptroller General, who heads the General Accounting Office (GAO) and serves as an agent of the Congress, is authorized and directed by law to conduct audits/evaluations of Federal Government agencies. GAO audits are independent examinations to determine how effectively and efficiently the agency program under review has performed its duties.

(c) Coast Guard Management Control Officer

The Management Effectiveness Staff, Commandant (G-CQM), is designated as the Coast Guard Management Control Officer and serves as the primary point of contact for internal and external audit activities, including DOTIG and GAO audits. In addition, Commandant (G-CQM):

- manages the Coast Guard audit program for evaluations and audits levied on the Coast Guard by all external audit entities, and develops Coast Guard policy and procedures for external audit response; and
- develops policies and procedures, coordinates and monitors all audit activities, oversees compliance with regulations on audit findings and recommendations, and tracks corrective actions.

(d) Acquisition Resource Management Staff

Commandant (G-A-1) serves as the Acquisition Directorate's point of contact for notification and conduct of audit activity. Commandant (G-A-1):

- coordinates queries from OST, OMB, Congress, and internal or external audit activities with applicable Commandant (G-A) organization elements and Commandant (G-CQM);
- provides guidance and direction to acquisition personnel when processing requirements of FMFIA/OMB Circular A-123; and
- maintains records of all audits impacting Acquisition, as well as related findings, responses and correspondence.

(e) Contract Planning, Procedures and Quality Engineering Division

Commandant (G-ACS-3), serves as the focal point for notification, conduct, control and coordination of contract and/or financial audits between the Acquisition Project Managers and internal/external audit agencies (for example Commandant (G-CPM) and the Defense Contract Audit Agency (DCAA)). Commandant (G-ACS-3) maintains ongoing liaison with Commandant (G-A-1), Commandant (G-CQM), and various Government audit agencies, including the OST Inspector General and DCAA.

(f) Project Managers and Matrix Personnel

Acquisition Project Managers and matrix personnel will cooperate in a positive manner with the representatives of all internal or external agencies in the performance of audit activities to the extent provided for in Coast Guard policy directives or as prescribed by applicable law or regulation. Project Managers and matrix personnel shall develop and maintain a well documented audit trail for their assigned project(s). The project counsel, Commandant (G-LPL) should be included in all audit presentations.

(5) Audit Procedures

Audit procedures will vary depending on the type of audit and the agency conducting the audit. PMs and matrix support personnel should confer with appropriate points of contact to review applicable audit procedures. When in doubt, PMs should contact Commandant (G-A-1) and (G-CQM) for assistance.

- In general, Commandant (G-CQM) will provide advance notice to applicable major acquisition project management for all audits. The Coast Guard considers 72 hours prior notice reasonable for an audit previously published in an audit plan. Ideally, Coast Guard acquisition project management organizations should receive advance notice at least five working days prior to the start of any unplanned audit. In either case, Acquisition Project Managers should contact Commandant (G-CQM) via Commandant (G-A-1) to discuss schedule conflicts, policy, participation, audit responsibilities or any other questions or concerns.

- An entrance briefing or conference held at the outset of each audit will be coordinated with the auditing agency representatives (auditors) by Commandant (G-CQM), Commandant (G-A-1), and Acquisition project management participants. The entrance briefing or conference serves to explain the purpose of the audit, define the audit scope and objectives, establish the necessary working arrangements, and obtain preliminary information about the organization or effort to be audited. Goals or objectives stated at the outset may change during the course of the audit.

- An exit briefing or conference is held at the completion of each audit to discuss the results of the audit and assure that the auditor has all available pertinent and factual information having any bearing on the audit.

- An audit agency will issue a draft or final audit report. Commandant (G-CQM) will assign responsibility for preparing the Coast Guard response to the report. Acquisition Project Managers may be assigned responsibility for preparing written responses or input to Coast Guard responses to the report(s) within specified periods of time. Commandant (G-CQM) provides guidance and direction for each response and ensures that each finding and recommendation is properly addressed.

- An audit recommendation is considered resolved when acquisition project management and the audit agency agree on the corrective action(s) to be taken on findings and recommendations presented in an audit. An audit recommendation is considered closed when the corrective action(s) agreed to during the resolution process is/are considered completed by the auditing agency. Only the auditing agency can close a recommendation, not the Coast Guard.

- Table 6-6 depicts recommended audit "dos and don'ts" to facilitate successful audit conduct.

AUDIT DO's and DON'Ts	
• Be proactive, plan to be audited and prepare accordingly	• Be reactive and wait until an audit is announced to prepare for it
• Participate in a positive manner	• Be obstructive or foster negative/adversarial attitudes
• Cooperate with auditors and the audit coordinators to provide requested information and include project counsel in all presentations	• Independently volunteer information - auditor will define the scope, focus and information requested
• Document! Document! Document! Build the project audit trail as the project progresses... contemporaneous, documented evidence is best and bolsters project credibility	• Create retroactive documentation - it looks suspicious and detracts from project credibility
• Be comfortable using the words "I don't know but I'll look into it and get back to you."	• Give a bad answer to a question rather than no answer at all

Table 6-6, Audit DO's and DON'Ts

PROJECT MANAGEMENT TOOLS

1. Purpose

The purpose of this enclosure is to provide guidance on effective project management tools to support acquisition efforts. The contents of this section list a variety of principles, functions, methods, and tools that can be tailored during a project. These areas include Work Breakdown Structures, Schedules and Scheduling Techniques, Cost Estimating and Analysis Techniques, Systems Engineering, Human Systems Engineering/Human Systems Interface (HSE/HSI), and Risk Management. The intent of this section is not to provide "cookie cutter" answers for all projects. **There are no such answers.** As no "solution" fits all problems in project management, no toolkit could hope to be complete for all projects. As newer products, tools and practices become available, this information will be published via the G-A-2 website. Currently, this guidance can apply to all Coast Guard major acquisition projects. This information supports Chapters 2 through 6 of this Manual.

2. Background

Project management provides centralized authority and control over all technical and business aspects of a project. The Project Manager (PM) needs to be aware of special considerations and tools to facilitate successful acquisitions. To be most effective, the PM must have the flexibility to accomplish these goals without an excessive administrative burden. The objective, when choosing and using project management tools, is effective, but not excessive, project planning and control. The tools described in this enclosure will aid the PM in producing or selecting desired products or services while maintaining the project schedule and staying within the project budget. Table 1-A lists the key considerations when deciding to use these management tools.

Key Considerations For Selecting Management Tools
• Project size and complexity
• Availability of resources (money, people, equipment) to develop and maintain
• Top management requirements
• User training, experience and acceptance

Table 1-A, Key Considerations for Selecting Management Tools

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3. Discussion

The following project management tools and special case acquisition considerations are provided to help PMs achieve successful, effective and efficient acquisitions.

a. Work Breakdown Structures

MIL-HDBK-881, Work Breakdown Structure, defines a Work Breakdown Structure (WBS) as a product-oriented family tree composed of hardware, software, services, data, and facilities, which define the total project. The WBS displays and defines the product(s) to be developed/selected and/or produced, and relates elements of work to be accomplished to the end product being acquired and to each other. The purpose of the work breakdown structure is to subdivide the project effort into sufficiently manageable units of work, to permit accurate resource and cost estimates, and to provide all levels of management with adequate visibility and control.

(1) Application of the WBS

The importance of the work breakdown structure cannot be overemphasized. The WBS is more than a tool for project planning and control, it is the framework upon which all technical, cost, and schedule definition, planning and project tracking are based. Effective project planning is unlikely without a sufficiently detailed WBS to identify the associated tasks to be performed. The WBS development process forces the Project Manager, the project staff, and organizations in the project matrix to think through all aspects of the project effort. The process requires a breaking down and further subdivision of each element to reach the lowest manageable work unit. In the process WBS element scope, complexity, and resources become smaller and smaller until work unit responsibility is assigned to a single organizational unit or individual. Project management personnel should refer to MIL-HDBK-881 for additional application guidance.

(2) WBS Terminology

(a) WBS Element

This term refers to the discrete portion of the WBS, which represents either an identifiable item of hardware, software, data set, or service.

(b) Level

This term refers to the level of detail or breakdown within the WBS (hardware/software system, subsystem, subroutine, component; data set, technical publication, data summary, data report, data list; support services, analysis, etc.).

Level zero usually identifies the project. Figure 1-A illustrates a WBS taken to the sixth level of detail and shows how lower or smaller subdivisions are identified by sequential numbers (Level 1, 2, 3, etc.). MIL-HDBK-881 defines the top three WBS levels as follows:

- Level 1 - the entire system or materiel item (e.g., the Aircraft System in Figure 1-A);
- Level 2 - major elements of the system or materiel item (e.g., Logistics or the Air Vehicle in Figure 1-A); and
- Level 3 - elements subordinate to Level 2 (e.g., the Airframe, or Avionics system in Figure 1-A).

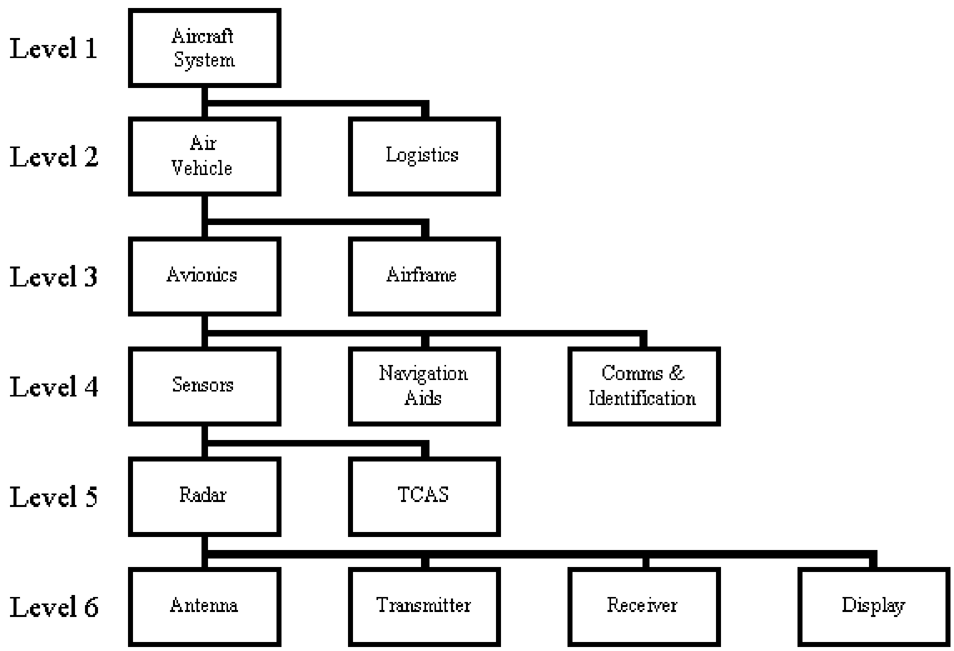

Figure 1-A, Work Breakdown Structure

(c) Product

This term refers to the end result of the work being performed in a particular WBS element (report, document, computer program, piece of hardware). Products are usually defined in the WBS at the lowest level.

- WBS Code - Each element in the WBS is assigned a code number that preserves and communicates the WBS subdivision logic for consistency in budgeting, scheduling, resource tracking, and progress monitoring.

- Work Package - The Work Package is the lowest level WBS element with resource and schedule assignments.

(3) WBS Types

There are different types of work breakdown structures, each having a specific purpose. Project management personnel should also refer to the seven WBS applications organized by material category in Appendices A through G of MIL-HDBK-881. These categories include aircraft systems, electronic and automated software systems, missile systems, ordnance systems, and ship systems (e.g., the Expanded Ship Work Breakdown Structure or ESWBS).

(a) Summary Work Breakdown Structure

The Summary Work Breakdown Structure is a WBS delineated to the third level.

(b) Project Summary Work Breakdown Structure (PSWBS)

The PSWBS is a summary WBS tailored to a specific major acquisition project and is related to contractual effort. The PSWBS equates to the Program Work Breakdown structure identified in MIL-HDBK-881.

(c) Contract Work Breakdown Structure (CWBS)

The CWBS is a complete WBS for a contract, developed and used by a contractor in accordance with MIL-HDBK-881 and the contract work statement. Only one CWBS is used in each request for proposal and the associated contract. CWBS levels may differ from PSWBS levels. For example Level 3 in the PSWBS may be Level 1 or 2 in the CWBS. In addition, not all PSWBS elements may be in each CWBS but the CWBS and PSWBS must be consistent with each other. Traceable summarization of individual CWBSs into the approved PSWBS shall be maintained.

(4) WBS Development

- WBS development begins with the recognition that the WBS is an end-item oriented structure. Its primary use lies in defining, communicating, clarifying, and associating project objectives in terms of successively smaller subdivisions of project effort.

- A common error in WBS development is the tendency to pattern the WBS after an organizational chart or a schedule. To reiterate, a WBS should be product (e.g., hardware items, software items, data sets or services) oriented. Generally speaking, there are no hard and fast rules for developing a WBS but good judgment is the primary criterion. In some cases, the level of WBS detail needed for effective control may be higher than the work package level.

- The WBS is usually developed by the Resource or Business Manager with significant PM and Task Group Leader involvement since they identify what tasks must be performed to attain project objectives.

(5) WBS Dictionary

The dictionary is an essential part of the WBS documentation. The WBS dictionary, is usually a listing of WBS elements, serves as an index for the collection of Task Commitment Memoranda. Typically, this index is developed in column format containing the following items: WBS code, WBS element title, and identification of the organization responsible for the task. When responsibility is shown, the index serves as a responsibility assignment matrix.

b. Schedules and Scheduling Techniques

Scheduling is the process of estimating the duration of WBS tasks and relating them to other tasks required to deliver products (e.g., hardware, software, data or services). Scheduling includes consideration of the known project constraints. There are three basic scheduling techniques applied to major acquisition projects: Gantt charts, milestone schedules, and network schedules. The three techniques are graphically depicted and compared in Figure 1-B.

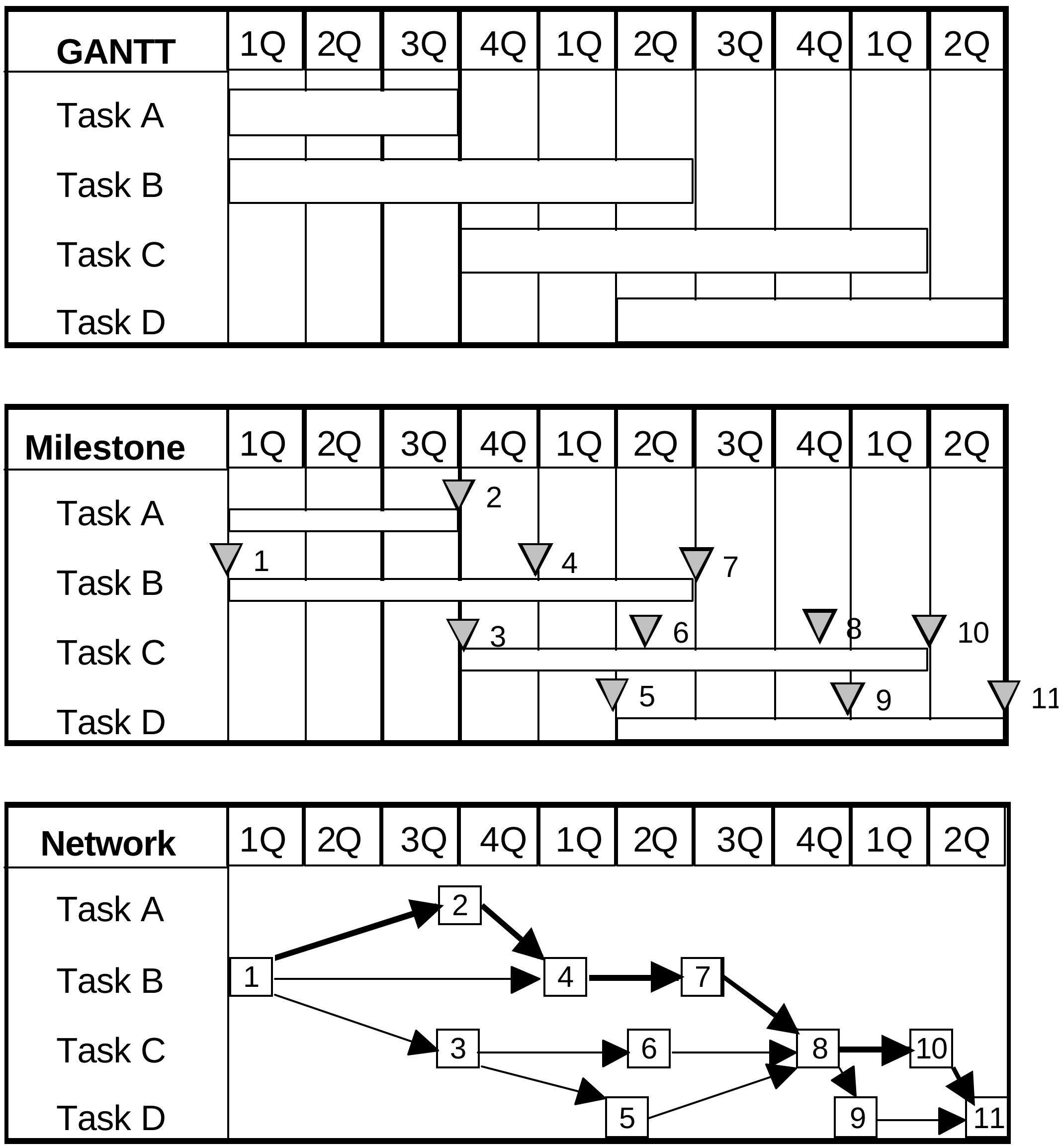

Figure 1-B, Scheduling Techniques

(1) Gantt Charts

One of the earliest and most elementary tools for schedule planning and control is the Gantt chart. The concept is relatively simple: activities to be tracked are listed down the vertical axis and the horizontal axis depicts time. A bar indicates the activity duration along with activity start and completion dates. The greatest asset of the Gantt chart is simplicity in both its construction and its ability to communicate information. The Gantt technique is most often used to show project summary schedules in a quick, one-page format. The single most important weakness of the Gantt technique is the inability to show interdependencies among activities and tasks. This results in the inability to determine the impact of adverse events on schedule flexibility. If an activity or event slips there is no certain way of telling if there is an overall schedule impact or recovery.

(2) Milestone Schedules

As in a Gantt chart, activities are listed on the vertical axis. Important task start, finish, and intermediate activity "check points" (events) are depicted along the horizontal axis. Relational milestone charts (such as Figure 1-D in the Systems Engineering section) overlay or relate multi-disciplined events for simple and effective communication. Relational milestone charts are most effective when incorporated in complex planning documents such as the Integrated Logistics Support Plan (ILSP), and the Test and Evaluation Master Plan (TEMP). Like the Gantt chart, the milestone schedule can be a simple, yet effective, method of communication.

(3) Network Schedules

The term networking refers to any technique that portrays task schedules in a scheme that explicitly defines the relationships among tasks. When applied to scheduling, a network diagrams the sequence of activities and relates these activities in terms of their start and finish points. Program Evaluation and Review Technique (PERT) and Critical Path Method (CPM) scheduling techniques focus on identifying the activities, which when delayed, have an impact on the total project schedule. The basic difference between the two is that the PERT permits explicit treatment of uncertainty in estimates of task duration while the CPM does not.

(a) Network Logic Schedule Development

The steps involved in developing network logic schedules are as follows:

1. Define the Activities

List tasks to be performed. This is done through development of the project summary work breakdown structure (PSWBS).

2. Define Activity Relationships

Identify predecessor/successor and lead/lag relationships (finish to start, start to start, and finish to finish) among tasks.

3. Obtain Time Estimates

Estimate the duration necessary to perform each activity. The project matrix element that will perform the task is best qualified to develop the estimate.

4. Incorporate External Constraints

Determine schedule constraints such as mandatory completion dates, intermediate milestone dates, contractual delivery dates, or interfaces with other projects.

5. Incorporate Resources Data

Apply constraints on availability of resources such as labor, material, equipment, machines, and funds to develop a feasible network schedule that can be achieved within resource limitations.

6. Establish a Baseline Schedule

Assign specific calendar dates to activities (and their resources) and issue as a baseline work plan. Identify activities on the critical path. The baseline schedule must be consistent with the technical and project baseline.

7. Planning the Schedule

A problem the PM will encounter in developing a project network schedule is the difficulty in identifying future activities as discrete entities with clear beginning and ending points, and clear relationships among tasks. The PM should identify and schedule near term tasks (those to be performed in the next 12 to 18 months) in more detail and longer-term tasks (those to be performed more than 18 months in the future) in lesser detail.

(b) Critical Path

The path through the network schedule that contains critical activities, i.e., those activities which, if delayed, will cause a slippage in the total project schedule, is determined to be the critical path. The critical path highlights activities to which the PM must pay the most attention.

(c) Schedule Hierarchy

The PM and the other organizations in the project matrix have different information needs. The PM develops a hierarchy of schedules to meet these differing needs. Typically, the Project Master Schedule included in the PMP represents the highest level and serves as a summary schedule for the PM and top management. Intermediate milestone schedules are oriented to the information needs of organizations in the project matrix, and detailed network schedules are used as working management tools for management control.

c. Cost Estimating and Analysis Techniques

There are three types of cost estimating/analysis techniques identified below. Figure 1-C shows when each technique is most likely to be applied as the acquisition progresses, data is developed, and the technique matures from gross estimates to detailed estimates.

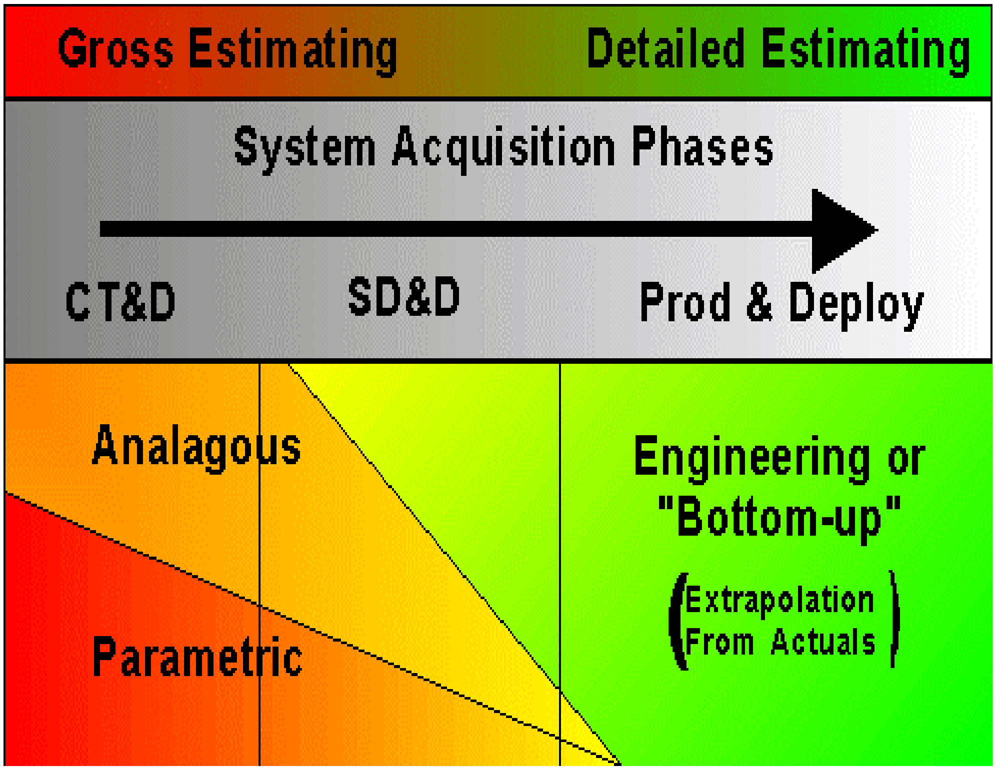

Figure 1-C, Cost Estimating Methods

(1) Parametric Method

The parametric technique uses regression analysis to establish statistically significant cost estimating relationships between independent variables (system performance and physical characteristics) and the dependent variable (system cost). This assumes a relationship between performance parameters such as speed, range, weight, etc., and cost. Parametric cost estimating is usually based on historical data. The data must reflect technology similar to that used in the system to be acquired. This method is used early in the acquisition process before detailed system specifications are available.

(2) Analogy Method

The analogy technique compares the system to be acquired with an existing system for which we have accurate cost and technological data. The accuracy of estimates by analogy depends on the ability of the estimator to accurately perceive similarities and differences between the new system and the existing system and to adjust estimated costs accordingly. The analogy method is most appropriate early in the acquisition when actual cost data for the system are not available.

(3) Engineering or "Bottom-Up" Method

This technique identifies costs associated with individual activities, processes, subsystems, and equipment and adds them together into an overall estimate from the "bottom-up." The engineering estimate starts at the lowest level with engineering drawings and specifications; it identifies and costs out labor tasks, tools, production operations, and material. It is often based on extrapolation of actual costs incurred to date. General overhead factors are then applied based on direct labor and material used. This method is most often used during the Full Scale Development and Production Phases of a project.

d. Systems Engineering Management Techniques

Systems Engineering (SE) is the application of diverse scientific and engineering disciplines to transform an operational need into a system which is operationally suitable and effective while meeting project cost, schedule, and technical performance objectives. SE is the management function to control the total system development (or system selection) effort for the purpose of achieving an optimum balance of all system aspects. It is a process that transforms an operational need into a description of system parameters and integrates those parameters to optimize overall system effectiveness and suitability. The DSMC Publication "Systems Engineering Fundamentals" (December 2000) provides a technical orientation to and tailoring guidance for Systems Engineering in acquisition projects.

(1) Systems Engineering Concepts

A comprehensive set of mission requirements stated in user oriented, mission performance terms, must be defined in order to carry out systems engineering. The requirements are technically refined over time as the design/development or system selection efforts progress in preparation for production, product improvement or product use. The systems engineering and design strategy must be included in the acquisition strategy and should consider whether system design/development should be conducted in-house (organically) or by a contractor (commercially). The PM must conduct periodic technical reviews to track the progress of the systems engineering efforts and to support configuration baselining. All analyses, studies, assessments, reviews, designs, audits, etc., must be documented in reports so that the PM has an audit trail for changes to the configuration baseline(s) and the acquisition project baseline(s) (APBs).

(2) Systems Engineering Process Overview

The systems engineering process is a comprehensive, iterative problem solving process applied sequentially top-down by integrated teams. It transforms needs and requirements into a set of system product and process descriptions, generates information for decision makers, and provides input for the next level of development. The process is applied sequentially, one level at a time, adding additional detail and definition with each level of development. As shown in Figure 1-D, the process includes: inputs and outputs; requirements analysis; functional analysis and allocation; requirements loop; verification; and system analysis and control.

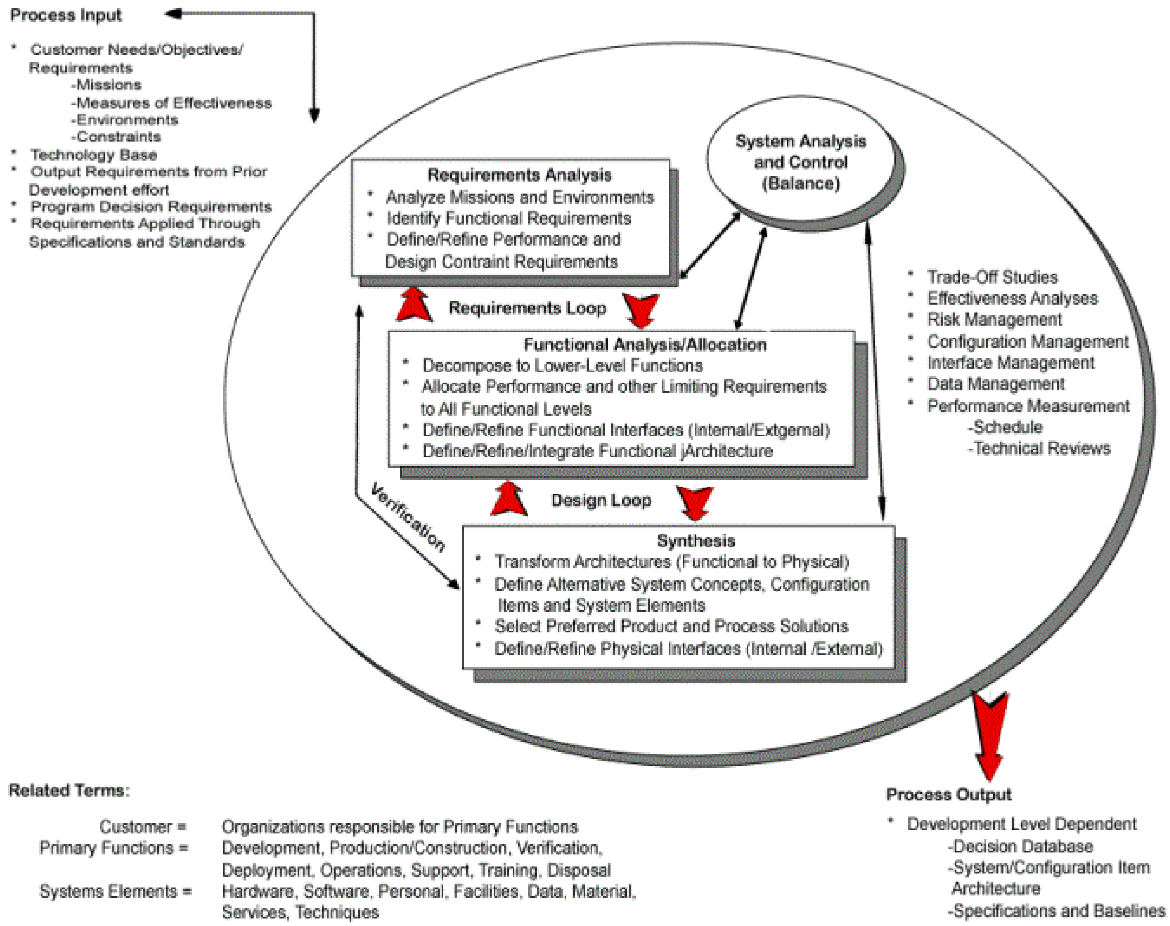

Figure 1-D, The Systems Engineering Process Requirements Analysis

(a) Systems Engineering Process Inputs

Inputs consist primarily of the customer's needs, objectives, requirements and project constraints. Inputs can include, but are not restricted to, missions, measures of effectiveness, environments, available technology base, output requirements from prior application of the systems engineering process, program decision requirements, and requirements based on "corporate knowledge."

The first step of the Systems Engineering Process is to analyze the process inputs. Requirements analysis is used to develop functional and performance requirements; that is, customer requirements are translated into a set of requirements that define what the system must do and how well it must perform. The systems engineer must ensure that the requirements are understandable, unambiguous, comprehensive, complete, and concise. Requirements analysis must clarify and define functional requirements and design constraints.

Functional requirements define quantity (how many), quality (how good), coverage (how far), time lines (when and how long), and availability (how often). Design constraints define those factors that limit design flexibility, such as: environmental conditions or limits; defense against internal or external threats; and contract, customer or regulatory standards.

(b) Functional Analysis/Allocation

Functions are analyzed by decomposing higher-level functions identified through requirements analysis into lower-level functions. The performance requirements associated with the higher level are allocated to lower functions. The result is a description of the product or item in terms of what it does logically and in terms of the performance required. This description is often called the functional architecture of the product or item. Functional analysis and allocation allows for a better understanding of what the system has to do, in what ways it can do it, and to some extent, the priorities and conflicts associated with lower-level functions. It provides information essential to optimizing physical solutions.

(c) Requirements Loop

Performance of the functional analysis and allocation results in a better understanding of the requirements and should prompt reconsideration of the requirements analysis. Each function identified should be traceable back to a requirement. This iterative process of revisiting requirements analysis as a result of functional analysis and allocation is referred to as the requirements loop.

(d) Design Synthesis

Design synthesis is the process of defining the product or item in terms of the physical and software elements which together make up and define the item. The result is often referred to as the physical architecture. Each part must meet at least one functional requirement, and any part may support many functions. The physical architecture is the basic structure for generating the specifications and baselines.

(e) Design Loop

Similar to the requirements loop described above, the design loop is the process of revisiting the functional architecture to verify that the physical design synthesized can perform the required functions at required levels of performance. The design loop permits reconsideration of how the system will perform its mission, and this helps optimize the synthesized design.

(f) Verification

For each application of the system engineering process, the solution will be compared to the requirements. This part of the process is called the verification loop, or more commonly, verification. Each requirement at each level of development must be verifiable. Baseline documentation developed during the systems engineering process must establish the method of verification for each requirement. Appropriate methods of verification include examination, demonstration, analysis (including modeling and simulation), and testing. Formal test and evaluation (both developmental and operational) are important contributors to the verification of systems.

(g) Systems Analysis and Control

Systems Analysis and Control include technical management activities required to measure progress, evaluate and select alternatives, and document data and decisions. These activities apply to all steps of the systems engineering process. Systems analysis activities include trade-off studies, effectiveness analyses, and design analyses. They evaluate alternative approaches to satisfy technical requirements and program objectives, and provide a rigorous quantitative basis for selecting performance, functional, and design requirements. Tools used to provide input to analysis activities include modeling, simulation, experimentation, and test. Control activities include risk management, configuration management, data management, and performance-based progress measurement, including event-based scheduling, technical performance measurement, and technical reviews. The purpose of Systems Analysis and Control is to ensure that:

- Solution alternative decisions are made only after evaluating the impact on system effectiveness, life cycle resources, risk, and customer requirements;
- Technical decisions and specification requirements are based on systems engineering outputs;
- Traceability from systems engineering process inputs to outputs is maintained;
- Schedules for development and delivery are mutually supportive;
- Required technical disciplines are integrated into the systems engineering effort;
- Impacts of customer requirements on resulting functional and performance requirements are examined for validity, consistency, desirability, and attainability and
- Product and process design requirements are directly traceable to the functional and performance requirements they were designed to fulfill, and vice versa.

(h) Systems Engineering Process Output

Process output is dependent on the level of development. It will include the decision database, the system or configuration item architecture, and the baselines including specifications, appropriate to the phase of development. In general, it is any data that describes or controls the product configuration or the processes necessary to develop that product.

(3) Systems Engineering Integration Objectives

Figure 1-E shows the framework for integrating various engineering and related disciplines through the SE process. Since the requirement to implement SE may cause major budgetary commitments and impact up-front development schedules, it is important to understand the inherent objectives. The basic SE objectives are identified below.

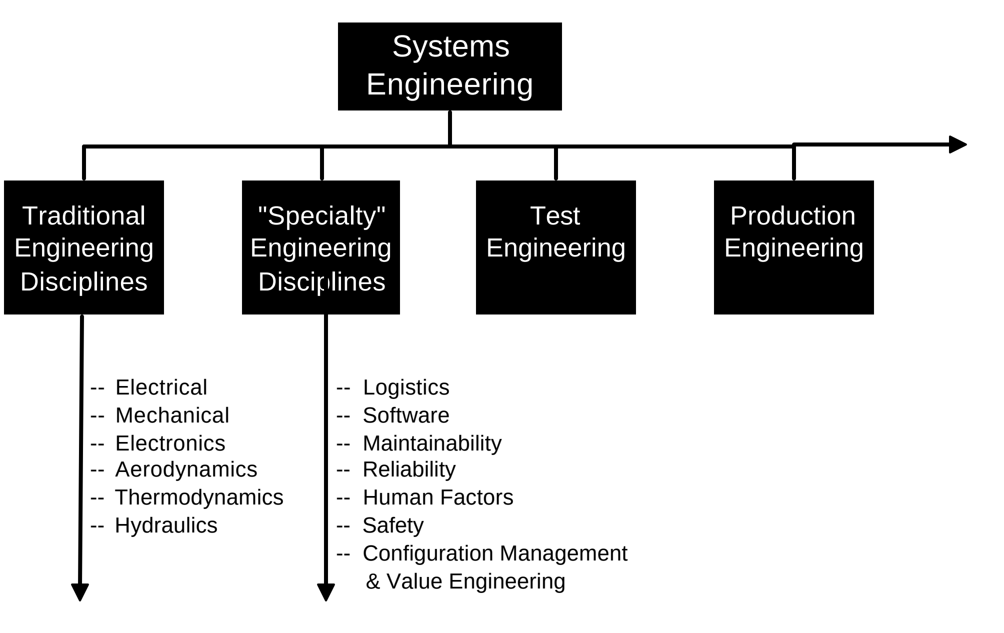

Figure 1-E, Systems Engineering Integration

- Ensure that system definition and design reflect requirements for all system elements, including equipment, software, personnel, facilities, and data.
- Integrate technical efforts of the design team specialists to produce an optimally balanced design.
- Provide a comprehensive framework of system requirements for use as performance, design, interface, support, production, and test criteria.
- Provide source data for development of technical plans and contract work statements.
- Provide a systems framework for logistics analysis, ILS trade-off analysis and engineering, and logistics documentation.

- Provide a systems framework for production engineering analysis, producibility trade studies, and production/manufacturing documentation.
- Ensure that life cycle cost considerations and requirements are fully considered in all phases of the design process.

(4) Systems Engineering Roles and Responsibilities

(a) Project Manager

The PM is responsible for conducting the government portion of the project SE effort and for monitoring the contractor conducted activities. Generally, the PM will be assisted by the Project Technical Manager, who will be responsible for the detailed, day-to-day systems engineering activities. The PM's basic responsibilities for project systems engineering are listed below.

- Direct feasibility studies and trade-off studies required as a result of the Preliminary Operational Requirements Document/ Operational Requirements Document (PORD/ORD) development process.
- Monitor contractor performance.
- Conduct technical reviews and configuration audits to establish and review configuration baselines and monitor project risk.

(b) Project Technical Manager

The project Technical Manager is a member of the PM's core staff and is responsible for the day-to-day coordination of systems engineering activities. The Technical Manager's basic project SE responsibilities are listed below.

- Oversee all government feasibility studies and trade-off analyses and studies. These studies may be conducted in-house (by the project or other support programs), by other government agencies, or by contractors.
- Establish and maintain a record of all systems engineering activities for the project.

- As applicable, prepare the Systems Engineering requirements section of the contract Statement of Work (SOW) and ensure the appropriate Data Item Descriptions (DIDs) and Contract Data Requirements List (CDRLs) are applied to the contractor effort.
- As applicable, monitor the contractor's efforts to ensure that all provisions of the contract are met. Resolve all technical issues with the contractor through the Contracting Officer (KO). Review all contractor generated reports and findings to assess their accuracy and completeness and provide the review results to the KO.

(c) Project Sponsor/Sponsor's Representative

The Project Sponsor/Sponsor's Representative identifies the required mission(s) in functional terms in the Mission Need Statement (MNS), states mission need in functional capabilities, and recommends life cycle cost goals. The Sponsor/Sponsor's Representative performs mission analysis to develop the information. Upon approval of the MNS, the Sponsor/Sponsor's Representative will prepare the PORD, which contains a hierarchy of priority-ranked requirements to aid the PM in conducting trade-off studies and analyses.

(d) Support Manager(s)

The Support Manager(s) provide technical support and resources to the SE process. This includes involvement in trade-off and feasibility studies. In some cases, Support Managers will have the lead responsibility for conducting trade-off and feasibility studies (under the guidance of the PM).

(e) Contractor(s)' Role

The contractor is responsible for conducting a Systems Engineering Management Program in accordance with the approved SOW. The contractor's SE program will include the timely and accurate submission of all systems engineering contract deliverables.

(5) Systems Engineering Documentation

The following analyses, studies and documentation pertain to effective Systems Engineering management.

(a) Business Planning

As discussed in Chapter 3, business planning is conducted and the MNS is prepared by the Sponsor to identify the required mission or mission need in terms of functional capabilities.

(b) Feasibility Studies

The PM conducts feasibility studies to determine if the thresholds and goals desired by the Sponsor and expressed in the PORD/ORD are achievable, both technically and economically.

(c) Trade-Off Analyses and Studies

The PM conducts trade-off analyses and studies to develop alternative system design concepts, which possess the required capabilities. The PM uses the priority ranked listing in the PORD/ORD to aid in weighting the various requirements.

e. Human Systems Engineering/Human Systems Interface

Human Systems Engineering (HSE) provides the methods, models, hardware, software, firmware, courseware, information management techniques, operating procedures, documentation, system design features, and data to integrate the human operator into a work system. HSE should be included in proposal preparation, systems analysis, task analysis, system design (including computer software design), equipment design, testing, documentation, and reporting. Human-related factors contribute to 60-80% of casualties. Many of these events could be prevented by incorporating human-centered design approaches into the acquisition process. HSE should be applied early and throughout the development and acquisition of systems/equipment to achieve effective integration of personnel into design. HSE should be used to develop or improve the personnel-equipment/software interface, to achieve required effectiveness of human performance during system/equipment operation/maintenance/control, and to make economical demands upon personnel resources, skills, training, and costs.

(1) HSE Functions

HSE should include, but is not limited to, active participation in three interrelated areas of system/equipment development: analysis, design and development, and test and evaluation.

(a) Analysis

Beginning with business planning, develop a baseline scenario to identify and describe the functions that should be performed by the system to achieve its mission objectives. These functions should be analyzed to determine the best allocation of functions to personnel, equipment, software, or combinations thereof. Allocated functions should be further dissected to define specific tasks that should be performed to accomplish the functions. Each task should be analyzed to determine human performance parameters, system/equipment/software capabilities, and the mission/environmental conditions under which tasks will be conducted. Where possible, task parameters should be quantified in a form permitting effectiveness studies of crew-equipment/software interfaces in relation to total system operation. Identification of HSE high-risk areas should be initiated as part of the analysis. Analysis should include application of HSE techniques as follows:

1. Defining and Allocating System Functions

The functions to be performed by the system in achieving its objective(s) within specified mission environments should be analyzed. HSE principles and criteria should be applied to specify personnel-equipment/software performance requirements for system operation, maintenance and control functions, and to allocate system functions to automatic operation/maintenance, manual operation/maintenance, or some combination thereof. Functional allocation is an iterative process ultimately achieving the level of detail appropriate for the level of system definition. From projected operator/maintainer performance data, estimated cost data, and known constraints, the contractor should conduct analyses and trade-off studies to determine which system functions should be machine-implemented or software-controlled, and which should be reserved for the human operator/maintainer.

2. Information Flow and Processing Analysis

- Analyses should be performed to determine basic information flow and processing required to accomplish the system objective and include decisions and operations without reference to any specific machine implementation or level of human involvement.
- Estimates of Potential Operator/Maintainer Processing Capabilities.
- Plausible human roles (e.g., operator, maintainer, programmer, decision maker, communicator, monitor) required in the system should be identified. Estimates of processing capability in terms of mental workload, accuracy, rate, and reaction time should be prepared for each potential operator/maintainer information processing function. These estimates should be used initially in determining allocation of functions, and later refined for use in definition of operator/maintainer information requirements and control, display, and communication requirements. In addition, estimates should be made of the effects on these capabilities likely to result from implementation or non-implementation of HSE design recommendations.

3. Equipment Selection

HSE principles and criteria should be applied along with all other design requirements to identify and select the particular equipment to be operated, maintained, or controlled by personnel. The selected design configuration should reflect HSE inputs, expressed in quantified or "best estimate" quantified terms, to satisfy the functional and technical design requirements and to ensure that the equipment meets or exceeds HSE criteria specified by the contract.

4. Task Analysis

Results of gross task analysis (at the macro-level) should be used as one of the bases for making design decisions, e.g., determining to the extent practicable before hardware fabrication, whether system performance requirements can be met by combinations of anticipated equipment, software, and personnel, and assuring that human performance requirements do not exceed human capabilities. These analyses should also be used as basic information for developing preliminary staffing levels; equipment procedures; skill, training, and communication requirements; and for supportability analysis and other documentation inputs, as applicable. More detailed analysis of critical tasks is necessary to identify system performance constraints (i.e., information requirements, location and condition of the work environment, tool and equipment requirements, manpower and personnel requirements, and communication requirements. Individual and crew workload analysis should be performed and compared with performance criteria. Analyses of tasks should be updated as required to remain current with the design effort and should be available to those responsible for other Human System Integration domains (i.e., manpower, personnel, training, system safety).

5. Design and Development

Design and development of the system equipment, software, procedures, and work environments associated with system functions requiring personnel interaction requires HSE analysis. HSE should convert the mission, system, and task analysis data into detailed design or development plans. This effort should create a personnel-system interface operable within human performance capabilities, meet system functional requirements, and accomplish Coast Guard mission objectives. The final design should include initial planning, system analyses, operational criteria and requirement, and engineering efforts.

6. Preliminary System and Subsystem Design

HSE principles and criteria should be applied to system and subsystem designs represented by design criteria documents, performance specifications, drawings and data (such as functional flow diagrams), system and subsystem schematic block diagrams, interface control drawings, overall layout drawings, and related applicable drawings provided in compliance with contract data requirements. The preliminary system and subsystem configuration and arrangement should satisfy personnel-equipment/software performance requirements and comply with HSE criteria specified in the contract.

7. Human System Engineering in Equipment Detail Design

During detail design of equipment, HSE should evaluate designs for compliance with appropriate criteria and guidelines. Personnel assigned HSE responsibilities by the contractor should participate in design reviews and engineering change proposal reviews of equipment and items involving personnel interfaces.

8. Studies, Experiments, and Laboratory Tests

Studies, experiments, and tests should be conducted during the Development Test and Evaluation period to address HSE and life support concerns specific to the system.

9. Equipment Detail Design Drawings

HSE principles and criteria should be applied to detail design drawings for systems and equipment to assure that the final product can be efficiently, reliably, and safely operated and maintained. The following drawings should be included, along with any other drawings depicting equipment important to system operation and maintenance by human operators:

- panel layout drawings,
- communication system drawings,
- overall layout drawings, and
- control drawings.

10. Work Environment and Crew Station Design

HSE should be used to design work environments and consider, where applicable, at least the following.

- Atmospheric conditions, such as composition, volume, pressure, and control for decompression, temperature, humidity, and air flow.
- Weather and climate aspects, such as hail, snow, mud, arctic, desert, and tropic conditions.
- Range of acceleration forces, positive and negative, including linear, angular, and radial.
- Acoustic noise (steady state and impulse), vibration, and impact forces.
- Provision for minimizing disorientation.
- Adequate space for personnel, their movement, and their equipment.
- Adequate physical, visual, and auditory links between personnel and their equipment, including eye position in relation to display surfaces, control, and external visual areas.
- Safe and efficient walkways, stairways, platforms, and inclines.
- Provisions for minimizing psycho-physiological stresses.
- Provisions to minimize physical or emotional fatigue, or fatigue due to work-rest cycles.
- Effects of clothing and personal equipment, such as full and partial pressure suits, fuel handler suits, body armor, polar clothing, and temperature-regulated clothing.
- Equipment handling provisions, including remote handling provisions and tools when materiel and environment require them.
- Protection from chemical, biological, toxicological, radiological, electrical, and electromagnetic hazards.
- Optimum illumination commensurate with anticipated visual tasks.
- Sustenance and storage requirements (i.e., oxygen, water, and food) and provision for refuse management.
- Crew safety protective restraints (shoulder, lap, and leg restraint systems, inertia reels, and similar items) in relation to mission phase and control and display utilization.
- Mishap recording devices.

11. Equipment Procedure Development

Based upon the human performance functions and tasks identified by Human Engineering analyses, HSE principles and criteria should be applied to the development of procedures for operating, maintaining, or otherwise using the system equipment. For computer systems where operating and maintenance procedures are largely determined by software programs, HSE should be applied throughout the software program planning and development. This effort should be accomplished to assure that the human functions and tasks identified through HSE analysis are organized and sequenced for efficiency, safety, and reliability; to provide inputs to the supportability analyses and other plans, where required; and to assure that the results of this effort are reflected in the development of operational, training, and technical publications.

12. Test and Evaluation

Test and evaluation should be conducted to verify that equipment design, software, and system environment meet HSE and life support criteria and are compatible with overall system requirements. The HSE function in test and evaluation is to:

- Demonstrate conformance of system, equipment, and facility design to HSE criteria,
- Confirm compliance with performance requirements where personnel are a performance determinant,
- Secure quantitative measures of system performance that are a function of the human interaction with equipment, and
- Determine whether undesirable design or procedural features have been introduced.

The fact that these functions may occur at various stages in system, subsystem, or equipment development does not preclude final HSE verification of the complete system. Both operator and maintenance tasks should be performed during the final system test as described in approved test plans.

a. Development Test and Evaluation Planning

HSE testing should be incorporated into the system test and evaluation program and should be integrated into engineering design and development tests, contractor demonstrations, flight tests, R&D acceptance tests, and other development tests. Compliance with HSE requirement should be tested as early as possible. HSE findings from design reviews, mockup inspections, demonstrations, and other early engineering tests should be used in planning and conducting later tests. HSE test planning should be directed toward verifying that the system can be operated, maintained, supported, and controlled by user personnel in its intended operational environment (e.g., use of checklists, data sheets, test participant descriptors, questionnaires, operating procedures, and test procedures), schedules, quantitative measures, test criteria, and reporting processes.

b. Operational Test and Evaluation Planning

HSE testing should be incorporated into plans for Independent Operational Test and Evaluation (IOT&E), when required, and Operational Test and Evaluation (OT&E). IOT&E/OT&E activities should include efforts to:

- Assess the integration of Human Factors Engineering into the design of hardware, software, and procedures,
- Include performance of operational tasks by typical users,
- Provide human performance and error rate data, and
- Verify that Human Factors Engineering design requirements have been satisfied.

13. Failure Analysis

All failures occurring during testing should be subject to a HSE review to differentiate between failures due to equipment alone, personnel-equipment incompatibilities, and those due to human error alone.

(2) Cognizance and Coordination

HSE should be coordinated with maintainability, System Safety/Health Hazards, reliability, integrated logistics support, survivability/vulnerability, and other Human Factors Engineering functions including biomedical, life support, personnel and training, and should be integrated into the total system program. Results of HSE test and evaluation should be incorporated into the Supportability Analysis documentation, and other applicable documentation.

(3) Documentation

Human Systems Engineering inputs should be incorporated in the following documents:

(a) Mission Need Statement

The Mission Need Statement (MNS) should specify any expected or existing Human Factors Engineering constraints.

(b) Preliminary Operational Requirements Document/ Operational Requirements Document

The Preliminary Operational Requirements Document/ Operational Requirements Document (PORD/ORD) should:

- Translate HSE concerns into man-machine interface design issues to be addressed during systems engineering,
- Review human-system interface characteristics that require complex manpower and training intensive tasks, or that adversely affect human performance, identifying those elements that will be targeted for HSE changes, and
- Identify how such human-system interface characteristics and factors can be circumvented through system design and HSE efforts.

(c) Test and Evaluation Master Plan

The Test and Evaluation Master Plan (TEMP) should:

- Address critical human issues to provide data to validate the results of HSE analyses, and
- Require identification of mission critical operation and maintenance tasks.

(d) Risk Assessment

Based on an assessment of predecessor or comparable systems and new technologies, high-risk areas in Human Systems Interface (HSI) should be identified. Risk mitigation efforts then should be applied to improve system performance, reduce MPT requirements and ownership costs, and reduce or eliminate critical human performance errors.

(e) References

The following documents provide guidance concerning HSE/HSI:

- MIL-HDBK-46855A - Human Engineering Program Process and Procedures,
- MIL-STD-1472F – Human Engineering, and
- American Society for Testing and Materials (ASTM) F1166-95a(2000)-Standard Practice for Human Engineering Design for Marine Systems, Equipment and Facilities.

The International Standards Organization (ISO) has published numerous ISO standards that address HSE issues. Project managers should obtain matrix support from the Office of Safety and Environmental Health (G-WKS) for advice and assistance in the areas of HSE/HSI.

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f. Risk Management Tools

Most decisions made during the management of a major acquisition involve some degree of risk. The Planning, Budgeting and Acquisition of Capital Assets, OMB Circular A-11, Part 3 states risk management must be central to the planning, budgeting and acquisition process for projects. Failure to analyze and manage the inherent risk in all acquisitions can contribute to cost overruns, schedule shortfalls and project failures. For each project, a risk analysis that includes how risks will be mitigated, minimized, monitored and controlled will help prevent these problems. This list of tools is designed to provide project managers, project staffs, etc. as a reference for dealing with project acquisition risk management. The list of resources below is intended to be a useful aid in practical application during the lifecycle of a project. The list is divided between software tools available to all government agencies and commercial products that can be purchased. [NOTE: Listing of the commercial products is not to be interpreted as an endorsement by the U.S. Coast Guard.]

(1) Software Tools:

- Automated Cost Estimating Integrated Tools (ACEIT) is an estimating system consisting of a suite of tools designed to assist cost analysts in arriving at cost estimates, conducting "what-if?" studies, developing cost proposals and evaluations, conducting risk and uncertainty analysis, and developing Cost Estimating Relationships (CERs). Its primary purpose is Financial Management. (www.aceit.com)

- The Automated Test Planning System (ATPS) is a set of rule-based expert system software tools designed to help improve the overall quality of Test and Evaluation (T&E) planning and reporting for Department of Defense (DoD) acquisition programs. (http://web.deskbook.osd.mil)

- Correlation Calculator for Cost-Risk Analysis (C-RISK) supports cost-risk analysis by assisting the user in estimating correlation between Work Breakdown Structure (WBS) and element cost probability distributions. Inter-element correlations are derived from estimated percentages of new technology required to develop each WBS element. Output is a correlation matrix that can be input into FRISK, Crystal Ball, @Risk and other software packages. (http://web.deskbook.osd.mil)

- Cost Analysis Strategy Assessment (CASA) is a bottom-up, accounting-type model. Besides performing the cost calculations to estimate and sum up LCC, the model contains a number of functions that automate many of the more routine analysis tasks. It works by taking the data entered, calculating the projected costs, and determining the probabilities of meeting, exceeding, or falling short of any LCC target value. CASA offers a variety of strategy options and allows the user to alter original parameters to observe the effects of such changes on strategy options. At any number of program junctions, inputs may be saved and calculations may be made to that point for later evaluation. (http://web.deskbook.osd.mil)

- Cost-Risk Identification and Management System (CRIMS), uses Government developed and commercial off-the-shelf (COTS) software for identifying, tracking, and storing cost-risk information. The user implements it in three phases. The main purpose of the system is to support Cost Risk/Cost Management. (http://web.deskbook.osd.mil)

- Formal Risk Analysis (FRISK), supports cost-risk analysis by allowing the user to statistically sum Work Breakdown Structure (WBS)-element costs, represented by probability distributions, to obtain a probability distribution of total cost. The primary purpose of this tool is Cost Management. (http://web.deskbook.osd.mil)

- ModRite - was developed to track, schedule, and provide a capability to deconflict aircraft modification installations. ModRite is sponsored by the Air Force Special Operations Command (AFSOC) and is used by program managers within AFSOC and the Special Operations Forces (SOF). ModRite's primary purpose is Project Management - modification tracking. (http://web.deskbook.osd.mil)

- New Attack Submarine (NSSN) On-Line Risk Database (NSSN OLRDB 2.0), is a software tool that supports a project's Risk Management Process. The tool helps IPTs in the identification, assessment, and management of handling efforts in areas that threaten the successful design, construction, operation, support, and eventual disposal of systems and its components. (http://web.deskbook.osd.mil)

- Parametric Review of Information for Costing and Evaluation (PRICE) - The PRICE models are used to estimate development, production, and operating/support costs. The models use parametrics and contain mathematical equations relating input variables to cost. The primary purpose of this tool is Financial Management. The PRICE estimating models are a computerized system for deriving cost estimates and schedules for hardware microcircuits; electronic, mechanical and structural modules; assemblies, subsystems, and systems; hardware operating and support costs; software sizing; software development; and software operating and support costs. (http://web.deskbook.osd.mil)

- Performance Analyzer for Windows (PA Win); is the Government and Commercial standard for the reporting and analysis of contract performance (Earned Value) data, including the Contract Performance Report (CPR), Cost/Schedule Status Report (C/SSR) and Contract Funds Status Report (CFSR). PA Win exports and will import a delimited flat. It also displays contract performance trends and calculates Estimates at Completion (EAC). The primary purpose of this tool is Performance Management and Analysis. (http://web.deskbook.osd.mil)

- Practical Software Management (PSM) Insight - PSM Insight is a PC-based software application that automates the PSM guidance. It is a measurement "workstation" that helps the user implement a comprehensive, yet flexible, measurement process. PSM Insight works with existing measurement tools, and provides for customization of both the up-front measurement requirements and the ongoing data analysis and reporting process, in order to meet the specific information needs of a software program. (http://web.deskbook.osd.mil)

- Program Manager's WorkStation (PMWS), is a systems engineering tool to help Program Managers with engineering issues such as design reviews, worst case analysis, risk management, and lessons learned. PMWS consists of a series of knowledge based software packages designed to provide acquisition and engineering information to the user. The five components of PMWS are: KnowHow, Technical Risk Identification and Mitigation System (TRIMS), Best Manufacturing Practices (BMP) Database, BMPnet, and SpecRite. (http://web.deskbook.osd.mil)

- RFP Guidelines. The RFP Guidelines is an electronic help file, for software development project leaders, offers guidance and suggested wording for preparing the SOW and RFP, Sections L & M in the following areas: Development Standards and Documentation; Software Capability Evaluations; Software Engineering Environment; Risk Management; Software Metrics; Software Security Requirements Engineering; Software Languages; Development Monitoring; Software Quality Assurance; Software Configuration Management; Software Test, Validation and Verification; and Replication, Distribution, Installation and Training (RDIT). (http://web.deskbook.osd.mil)

- Risk Matrix is an automated tool that supports a structured approach for identifying risk and assessing its potential program impact. (http://web.deskbook.osd.mil)

- Schedule/Cost Risk Analysis Module (SCRAM!) is a risk analysis/decision support tool that adds probabilistic duration, cost, and logic analysis capabilities to Microsoft (MS) Project. (http://web.deskbook.osd.mil)
- SEER - Software Estimation Model (SEER-SEM) is a software development and maintenance analysis Computer Aided Software Engineering (CASE) tool that estimates software development and maintenance cost, effort, schedule, reliability and risk. It includes a knowledge base of algorithms to aid the analyst in producing concept level estimates. The primary purpose of this tool is cost estimating. (http://web.deskbook.osd.mil)

(2) Commercial Products:

- Artemis. - The Artemis product suite provides tailored and customized applications for planning and control of projects. Software packages include: Views, ProjectView, TrackView, GlobalView, and CostView. (www.artemispm.com)
- Crystal Ball - Automates the What-If Process and gives the user a glimpse of the risk. It allows the user to choose a range for each uncertain value in a spreadsheet and performs hundreds of what-if analyses. These analyses are summarized in an easy-to-read graph showing the probability for each result. Crystal Ball's Sensitivity Analysis shows the user which factors drive outcomes. Crystal Ball also allows graphics and reports to present results. It is for strategic planners, financial analysts, engineers, etc. (www.decisioneering.com)
- Dekker, Ltd. TRAKKER - works in conjunction with MS Project to provide an activity based costing system used to track project costs, conduct planning and integrate project control to the finance system. (www.dtrakker.com)
- Decision Products, Inc. RISK DRIVER - is a software product that incorporates the company philosophy of Preemptive Project Risk Management. The program plan is the core of the process of identifying risk areas and determining the drivers that can cause a plan to fail. It accounts for cash flow and duration of all types of risk. (www.riskdriver.com)
- Mantix Systems CASCADE - software tool is used to provide a comprehensive view of multiple project and task elements simultaneously including plans, costs, schedules, responsibilities and resources in a multi-user environment. (www.mantix.com)
- Monte Carlo™ 3.0 for Primavera - is a Windows product that helps users create realistic schedules and resource plans. It takes schedules and simulates project performance to assess the likelihood of finishing on-time and within budget. Users can evaluate the whole project or individual segments based on a

quantifiable measure of risk. Monte Carlo is an analysis tool that helps users make decisions, develop contingency plans, evaluate mitigation strategies and manage risk. (www.primavera.com)

- Palisade Corporation's DecisionTools Suite - is an integrated set of five risk and decision analysis programs. The products run from a common toolbar in Microsoft Excel. The DecisionTools Suite allows you to account for and manage the uncertainty in any decision situation using Monte Carlo simulation (@RISK), sensitivity and scenario analysis, decision trees & influence diagrams (PrecisionTree), distribution fitting and viewing (BestFit and RISKview), and what-if analysis (TopRank). (www.palisade.com)

- Palisade Corporation @RISK - is the risk analysis and simulation add-in for Microsoft Excel. Simply replace uncertain values in your spreadsheet with @RISK distribution functions to represent the range of uncertainty, then run a Monte Carlo simulation. @RISK recalculates the spreadsheet hundreds or even thousands of times, providing distributions of possible outcome values. Results can be displayed graphically in a variety of formats as well as through detailed statistical reports including sensitivity and scenario analyses. (www.palisade.com)

- RiskTrak Project Management - is a project-level management software tool that is designed specifically to manage cost, schedule, and technical risks in projects and programs. It is free standing network software and runs on any Windows platform. The design allows an entire team or organization to view, track, analyze, communicate and report on risks throughout the duration of a program or project in real time. It is capable of Earned Value tracking. (www.risktrak.com)

- Robbins - Gioia Inc. Earned Value Program Management Solution – this software provides a means of objectively comparing the amount of work completed against the amount of work planned for any particular project. (www.rgalex.com)

- Welcom Software Technology. OPEN PLAN – this software provides a PM a means to find the most efficient ways to allocate resources and organize activities. It also helps to identify and control risks. COBRA software is a cost management system designed to manage and analyze budgets, earned value, actuals, and forecasts. (www.wst.com)

LIST OF ACRONYMS

ABL	Allocated Baseline
AC&I	Acquisition, Construction, and Improvement
ACD	Allocated Configuration Documentation
ACEIT	Automatic Cost Estimate Integration Tools
ACO	Administrative Contracting Officer
ACP	Agency Capital Plan
ADM	Acquisition Decision Memorandum
AE	Acquisition Executive
AEL	Allowance Equipage List
AFC	Allotment Fund Code
ANSI	American National Standards Institute
A_o	Operational Availability
AP	Acquisition Plan
APB	Acquisition Project Baseline
APL	Allowance Parts List
APS	Acquisition Phase Summary
AR&SC	Aircraft Repair and Supply Center
ASP	Acquisition Strategy Proposal

ASQC	American Society of Quality Control
ASTM	American Society for Testing and Materials
ATE	Automated Test Equipment
ATPS	Automation Test Planning Systems
BAFO	Best and Final Offer
BIT	Built-In Test
BITE	Built-In Test Equipment
BST	Builder's Sea Trials
BY	Budget Year
C/PET	Cost/Price Evaluation Team
C2CEN	Command and Control Engineering Center
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
CA	Competition Advocate
CALMS	Combined Allowance for Logistics and Maintenance Support
CAMP	Competitive Acquisition Management Panel
CANDI	Commercial and Non-Developmental Items
CAS	Cost Accounting Standards
CBA	Cost Benefit Analysis
CBD	Commerce Business Daily
CBR	Chemical, Biological and Radiological
CBT	Computer-Based Training

CCA	Clinger-Cohen Act
CCB	Configuration Control Board
CCMP	Cutter Class Maintenance Plan
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CEA	Cost Effectiveness Analysis
CER	Cost Estimate Relationships
CF	Contractor Furnished
CFO	Chief Financial Officer
CFR	Code of Federal Regulations
CGAP	Coast Guard Acquisition Procedures
CGARC	Coast Guard Acquisition Review Council
CGPMS	Coast Guard Planned Maintenance System (electronics)
CGSD	Coast Guard Support Date
CGTO	Coast Guard Technical Order
CI	Configuration Item
CIO	Chief Information Officer
CKO	Chief Knowledge Officer
CLIN	Contract Line Item Number
CM	Configuration Management
CMAN	Configuration Manager
CMCL	Contract Management Life Cycle Phases

CMP	Configuration Management Plan
COI	Critical Operational Issue
COMDTINST	Commandant Instruction
COR	Circular of Requirements
COSAL	Consolidated Shipboard Allowance List
COTR	Contracting Officer's Technical Representative
COTS	Commercial Off-the-Shelf
CPM	Critical Path Method
CR	Configuration Review
CRB	Contract Review Board
CRIMS	Cost-Risk Identification and Management Systems
CSA	Configuration Status Accounting
CSCI	Computer Software Configuration Item
CTD	Concept and Technology Development Phase
CWBS	Contract Work Breakdown Structure
DAWIA	Defense Acquisition Workforce Improvement Act
DCAA	Defense Contract Audit Agency
DCN	Design Change Notice
DID	Data Item Description
DMI	Depot Maintenance Inter-service
DoD	Department of Defense
DOT	Department of Transportation

DOTIG	Department of Transportation Inspector General
DP	Deployment Plan
DT	Developmental Test
DT&E	Developmental Test and Evaluation
EA	Environmental Assessment
ECP	Engineering Change Proposal
ECR	Engineering Change Request
EEIS	Electronic Equipment Information System
EIA	Electronics Industries Alliance
EIA	Environmental Impact Analysis
EILSP	Equipment Integrated Logistics Support Plan
EIR	Electronics Inventory Record
EIS	Environmental Impact Statement
ELC	Engineering Logistics Center
ELCINST	Engineering Logistics Center Instruction
EMI	Electro-Magnetic Interference
ERPAL	Electronic Repair Parts Allowance List
ESD	Electro-Static Discharge
ESS	Equipment Support Summary
ESWBS	Expanded Ship Work Breakdown Structure
FAR	Federal Acquisition Regulation
FAT	Final Acceptance Trials

FBL	Functional Baseline
FCA	Functional Configuration Audit
FCD	Functional Configuration Documentation
FMECA	Failure Mode and Effects Criticality Analysis
FMFIA	Federal Managers' Financial Integrity Act
FOC	Full Operational Capability
FONSI	Finding of No Significant Impact
FOT&E	Follow-On Operational Test and Evaluation
FPR	Final Proposal Revisions
FRISK	Formal Risk Analysis
FRP	Full Rate Production
FY	Fiscal Year
GAO	General Accounting Office
GF	Government Furnished
GFE	Government Furnished Equipment
GFI	Government Furnished Information
GFM	Government Furnished Material
GFP	Government Furnished Property
GPETE	General Purpose Electronic Test Equipment
GPRA	Government Performance and Results Act
GSA	General Services Administration
GUCL	General Use Consumables List

H/W	Hardware
HAZMAT	Hazardous Material
HCA	Head of the Contracting Activity
HM	Hazardous Materials
HM&E	Hull, Mechanical, and Electrical
HOA	Head of Operating Administration
HQINST	Headquarters Instruction
HQPC	Headquarters Program Coordinator
HRP	Human Resources Plan
HSC	Headquarters Support Command
HSE/HSI	Human Systems Engineering/Human Systems Interface
HW	Hazardous Waste
HWCI	Hardware Configuration Item
ICD	Interface Control Drawing/Documentation
ICP	Inventory Control Point
ICW	Interactive Courseware
ICWG	Interface Control Working Group
IFB	Invitation for Bids
ILS	Integrated Logistics Support
ILSM	ILS Manager (same as Logistics Manager)
ILSMT	Integrated Logistics Support Management Team
ILSP	Integrated Logistics Support Plan

IOA	Independent Operational Assessment
IOC	Initial Operational Capability
IOT&E	Independent Operational Test and Evaluation
IOTEA	Independent Operational Test and Evaluation Advisor
IRM	Information Resource Management
IS	Information Systems
ISO	International Standards Organization
IT	Information Technology
ITMRA	Information Technology Management Reform Act
IV&V	Independent Verification & Validation
JA-30	Office of Information and Technology and Financial Audits
JLC	Joint Logistics Commanders
KDP	Key Decision Point
KO	Contracting Officer
KPP	Key Performance Parameters
LCC	Life Cycle Cost
LCCE	Life Cycle Cost Estimate
LEM	Logistics Element Manager
LOR	Level of Repair
LORA	Level of Repair Analysis
LRIP	Low Rate Initial Production
LRP	Long Range Plan

LRRAP	Long Range Resource Allocation Planning
LSA	Logistic Support Analysis
LSAR	Logistic Support Analysis Record
MA	Mission Analysis
MAIS	Major Automated Information System
MAPC	Major Acquisition Project Charter
MAT	Maintenance Augmentation Teams
MDAPS	Major Defense Acquisition Programs
MICA	Management Information for Configuration and Allowance
MIL-HDBK	Military Handbook
MIL-PRF	Military Performance Standard
MIL-STD	Military Standard
MIPR	Military Interdepartmental Purchase Request
MLC	Maintenance and Logistics Command
MNS	Mission Need Statement
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MP&T	Manpower, Personnel, and Training
MSAM	Major Systems Acquisition Manual
MSD	Material Support Date
MSG	Maintenance Support Guide
MSO	Maintenance Support Outline

MTBF	Mean Time Between Failures
MTL	Master Training List
MTTR	Mean Time To Repair
MWR	Morale, Welfare, and Recreation
NDI	Non-Developmental Item
NEPA	National Environmental Policy Act
NOR	Notice of Revision
O&S	Operation and Support
OA	Operational Assessment
OE	Operational Expenses
OFCO	Operating Facility Change Order
OFPP	Office of Federal Procurement Policy
OGA	Other Government Agency
OIG	Office of the Inspector General
OJT	On-the-Job Training
OMB	Office of Management and Budget
OPD	Operating Program Director
OPM	Operating Program Manager
ORD	Operational Requirements Document
OSC	Operations Systems Center
OSHA	Occupational Safety and Health Act
OST	Office of the Secretary of Transportation

OT	Operational Test
OT&E	Operational Test and Evaluation
P&D	Production & Deployment Phase
PAA	Personnel Allowance Amendment
PAL	Personnel Allowance List
PAT	Preliminary Acceptance Trials
PAT&E	Production Acceptance Test and Evaluation
PBL	Product Baseline
PCA	Physical Configuration Audit
PCAF	Preliminary Crew Assembly Facility
PCCMP	Preliminary Cutter Class Maintenance Plan
PCD	Product Configuration Documentation
PCI	Product Configuration Identification
PCO	Procuring Contracting Officer
PD	Project Director
PDR	Preliminary Design Review
PDR	Project Deviation Report
PEAG	Proposal Evaluation and Analysis Group
PEP	Proposal Evaluation Procedures
PERT	Program Evaluation and Review Technique
PHS&T	Packaging, Handling, Storage/Stowage and Transportation
PM	Project Manager

PMP	Project Management Plan
PMS	Planned Maintenance System
PNP	Project Nomination Proposal
POC	Point of Contact
PORD	Preliminary Operational Requirements Document
PPS	Post-Production Support
PPT	Past Performance Team
PRO	Project Resident Office
PRR	Production Readiness Review
PSWBS	Project Summary Work Breakdown Structure
PTD	Provisioning Technical Data
PTP	Project Termination Plan
QA	Quality Assurance
QAMP	Quality Assurance Management Plan
QASPM	Quality Assurance Support Program Manager
R&D	Research and Development
R&DC	Research and Development Center
R&M	Reliability & Maintainability
RAM	Reliability, Availability, and Maintainability
RCM	Reliability Centered Maintenance
RCP	Resource Change Proposal
RDT&E	Research, Development, Test and Evaluation

RFD	Request for Deviation
RFP	Request for Proposal
RIA	Resource Impact Assessment
RM&A	Reliability, Maintainability, and Availability
RMA	Reliability, Maintainability, Availability
ROM	Rough Order of Magnitude
RP	Resource Proposal
SAB	Support Allowance Billet
SAE	Society of Automotive Engineers
SAR	Search and Rescue
SCN	Specification Change Notice
SDD	System Development & Demonstration Phase
SDR	System Design Review
SE	Support Equipment
SE	Systems Engineering
SEB	Source Evaluation Board
SEH	Safety and Environmental Health
SFCAM	Shore Facilities Capital Asset Management
SM&R	Source, Maintenance and Recoverability (code)
SMEF	Systems Management Engineering Facility
SOO	Statement of Objectives
SOW	Statement of Work

SP	Selection Plan
SPD	Support Program Director
SPETE	Special Purpose Electronics Test Equipment
SPETERL	Ship Portable Electrical/Electronic Test Equipment Requirements List
SPM	Support Program Manager
SPPBES	Strategic Planning, Long Range Planning, Programming, Budgeting, Execution and Evaluation System
SPPSP	Selection Process Pre-Solicitation Period
SR	Sponsor's Representative
SRR	System Requirements Review
SSA	Software Support Activity
SSA	Source Selection Authority
SSO	Source Selection Official
SSR	Software Specification Review
T&E	Test and Evaluation
TAB	Training Allowance Billets
TAM	Transportation Acquisition Manual
TAR	Department of Transportation Acquisition Regulation
TBD	To Be Developed /Determined
TCM	Task Commitment Memorandum
TEMP	Test and Evaluation Master Plan
TET	Technical Evaluation Team

TGL	Task Group Leader
TISCOM	Telecommunications and Information Systems Command
TL	Task Leader
TM	Technical Manual
TMCR	Technical Manual Contract Requirement
TMOT	Test Management Oversight Team
TOC	Total Ownership Cost
TPM	Technical Performance Measurement
TPS	Test Program Set
TRR	Test Readiness Review
UIC	Unit Identification Code
USCG	United States Coast Guard
VE	Value Engineering
VECP	Value Engineering Change Proposal
WBS	Work Breakdown Structure